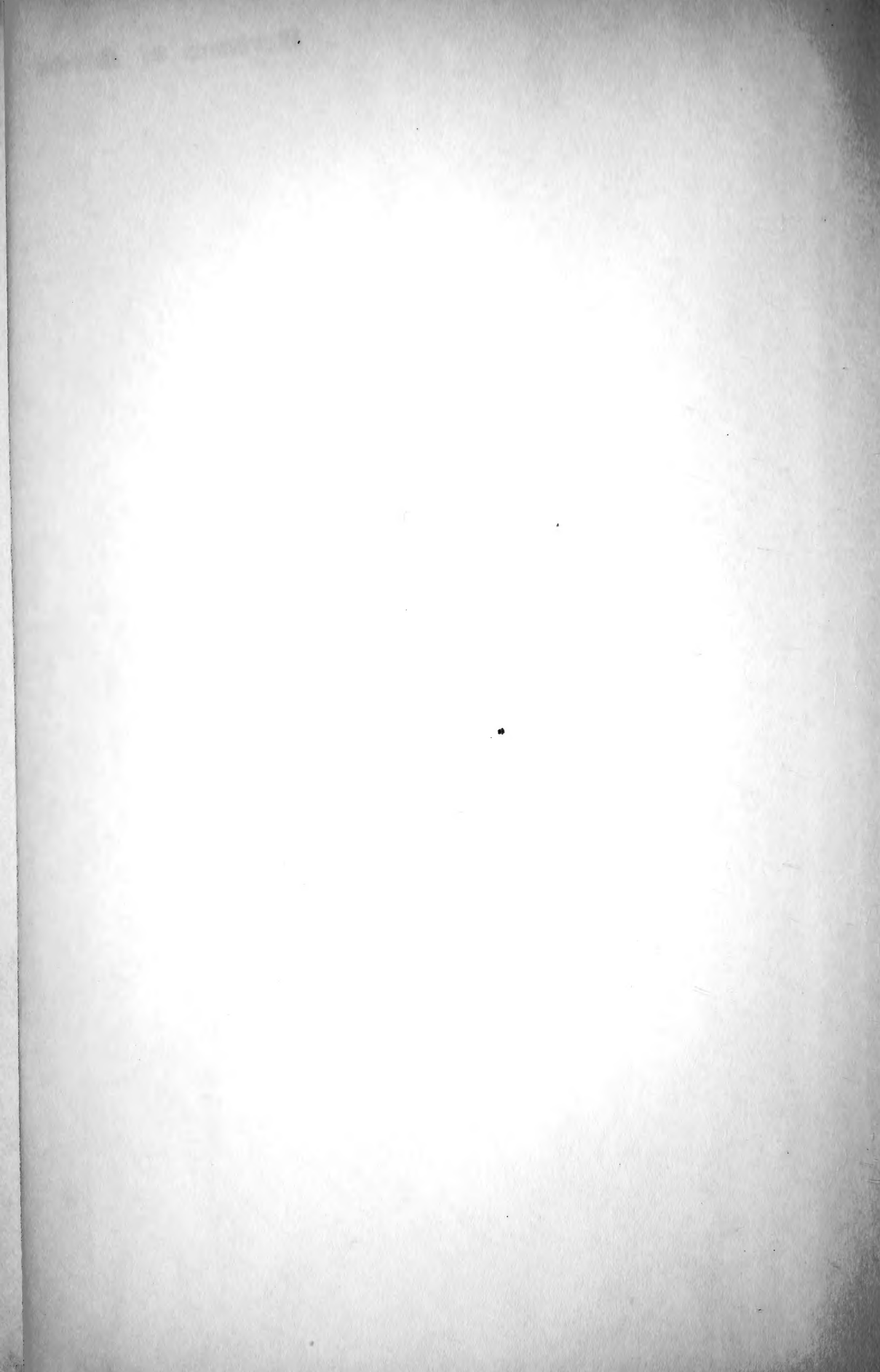




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# THE CONDOR

A Magazine of Western  
Ornithology



Volume XXIII

January-February, 1921

Number 1



W.K.F.

COOPER ORNITHOLOGICAL CLUB

San Jose  
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A Magazine of Western Ornithology  
Published Bi-Monthly by the Cooper Ornithological Club

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Entered as second-class matter November 29, 1919, at the post-office at Berkeley, California, under Act of Congress of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized January 5, 1921.

Issued from the Office of THE CONDOR, Museum of Vertebrate Zoology, Berkeley, California

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**Two Dollars per Year** in the United States, payable in advance.

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*Issued February 5, 1921*

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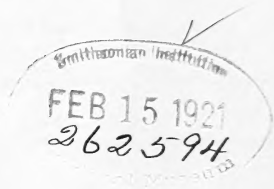
# THE CONDOR

A MAGAZINE OF  
WESTERN ORNITHOLOGY

Edited by  
Joseph Grinnell

Harry S. Swarth  
Associate Editor

J. Eugene Law  
W. Lee Chambers  
Business Managers



Volume XXIII  
1921



Published Bi-monthly  
by the  
Cooper Ornithological Club  
Berkeley, California

THE CONYER



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## ACORN-STORING BY THE CALIFORNIA WOODPECKER

By WILLIAM E. RITTER

WITH FOUR PHOTOS

NOT MANY phenomena of bird life in California are more widely known and have been more frequently commented upon than the one which is the subject of this article. When, however, one inquires about the extent of accurate knowledge on the subject, he may well be surprised that it is so slight. Even the published references to it, though numerous, are mostly brief and general. And no ornithologist, so I am told by Professor Joseph Grinnell, the authority on the literature of California birds, has pretended to investigate the subject in any detailed way. The following pages contain the results of observations and reflections which, though extending over several years, were chiefly made during the last year and a half.

So well known are the facts in their general features that a very cursory statement of them is enough. The California Woodpecker (*Melanerpes formicivorus bairdi*) is resident in most of the wooded portions of California. It has the habit, especially in regions where oaks abound, of pecking holes on the surface of the trunks and larger limbs of trees, these holes approximating an acorn in size, and inserting acorns into these, usually one in each hole. I have, however, seen many holes containing two nuts, not very close-fitting at that.

Where oaks and pines are commingled, as they frequently are in California, the pines are usually taken as storage trees. So far as I have observed, only the older trees are utilized, this seemingly being due to the fact that only in such trees has the outermost bark layer become marked off into areas or blocks presenting considerable unbroken surfaces suitable for the holes. Query is frequently made as to whether this hole pecking is injurious to the trees. Although I have examined many storage pines in widely separated localities. I have never seen anything even suggestive of harm to the trees from the holes. Never, so far as I have noticed, do the holes pierce through into the deeper living layers of the bark.

Though pine trees are, according to my observations, by far the most generally utilized for storing, oaks are used to some extent, even in places where pines as well as oaks are available. But in no instance have I seen a living oak so used. Not only dead oaks but those from which the bark has been shed are usually requisitioned, so it seems. The possible bearing of this will be noticed later.

Although unusual animal performance like this is sufficient in itself to excite interest and elicit careful inquiry, the thoughtful naturalist is likely to be more attracted to particular phenomena by their probable bearing on some general problem in which he is interested, than by their uniqueness. The broader problem which, in this instance, has been the leading motive of my observations, is that of the efficiency of instinctive activity. How thoroughly do such practices meet the needs of the animals which perform them? In other words, how near to perfection is their adaptiveness?

Two early cursory observations raised the conjecture that the habit of the California Woodpecker might, if followed up, yield enlightening facts on this question. One of these was the very large number of holes I had seen in some trees. Thus, fifty feet of a prostrate pine tree which I saw in the San Jacinto Mountains several years ago, contained, according to an estimate made with considerable care, 31,800 holes. The query easily arises, Is every hole in such a case actually used as the receptacle of a nut? The account which follows will bring out rather convincing testimony on this question.

The other and much more striking fact bearing on the general problem of adaptiveness, was brought to my notice by Dr. Grinnell. It is that occasionally the woodpeckers gather pebbles instead of acorns and place them in the holes. The first instance of this which came to my attention consisted of a considerable section of a barkless oak log now in the Museum of Vertebrate Zoology at Berkeley (Fig. 2), in which there is a large number of holes nearly all of which contain pebbles. This specimen, which came from Sonoma County, California (where there are no pine trees) is conclusive proof to Dr. Grinnell that the pebble-storing as well as the acorn-storing is the work of woodpeckers. Grinnell tells me that he looked into the matter at the time the specimen was received and found that the location of the tree and other conditions were such as to preclude any likelihood that the work was done by humans. Nor is there any other animal resident in that locality to which the performance could be attributed with any degree of probability.

Nor does this case of pebble-storing stand alone. Mr. C. R. Orcutt, a naturalist of wide experience in the southwest, has recorded a similar instance observed by him in Lower California ("Stones placed in pine-trees by birds", *Science*, March 14, 1884, p. 305). The trees (Jeffrey pines) were in this instance situated at an elevation of 6,000 feet and in an almost uninhabited region, so there was practically no chance for the stones to have been put where they were by human hands.

#### OBSERVATIONS

During a holiday outing at Cuyamaca reservoir, San Diego County, California, July 3-5, 1919, I found numerous pines (Jeffreys) used by the woodpeckers as storage trees. Some of these contained a large number of holes, the great majority of which were filled with acorns of the black oak (*Q. kelloggii*), the prevailing oaken neighbors of these pines. But while some of the trees were thus well stored, others had only a fraction of the holes acorn-filled; and two trees in particular, as thickly punctured as any I have ever seen, contained not a single acorn or any litter roundabout indicating that the birds had given the trees the least attention for many a month.

One of these abandoned granaries struck me as specially interesting from the fact that many of the holes, though not new, were to all appearances in perfect condition for the reception of nuts; and the further fact was clear

that both oaks and acorns were abundantly present all about the pine. Why was so much good store room unused? This query was made pertinent by the fact that many new holes had recently been made in near-by trees. Undoubtedly the suitability of the holes for storing suffers impairment with age. As the trees grow older, the outermost layers of bark gradually crumble away and reduce the depths of the holes so they would need re-drilling to keep them at full depth. Whether such renovation ever really takes place or not, I am not certain, but probably it does in some instances. Then, too, occasionally holes become more or less filled with pitch. But neither of these sources of



Fig. 1. NORMAL ACORN-STORAGE BY CALIFORNIA WOODPECKER, IN DEAD BRANCH OF BLUE OAK; PORTION PRESERVED IN MUSEUM OF VERTEBRATE ZOOLOGY TAKEN BY I. L. KOPPEL NEAR GILROY, CALIFORNIA, IN OCTOBER, 1919.

impairment applied to very many of the holes in the particular tree to which reference is now made.

By measurements and countings on one of the most abundantly stored trees of this lot, I estimated that there was an average of 60 acorns per square foot of bark and that in an area of the trunk surface, having an average girth of eleven feet, and a height of twenty feet, there were stored 13,200 acorns. Although many nuts could be seen above the elevation indicated, the size of the trunk and the irregularity of distribution of nuts made it impractical to estimate numbers. Since I shall have occasion to refer to this particular tree

in speaking of later visits, I will call it storage-tree A. Examination of the acorns in this and other trees of the locality yielded the following results that seemed significant.

Almost certainly a very great proportion of all the nuts were of the crop of the preceding year, 1918, and were garnered in the fall of that year. This conclusion I am able to draw now from observations made then and since. The evidence is in the state of weathering of the exposed butt ends of the acorns. Almost without exception the nuts are inserted tip in and base out, most of them fitting the hole snugly. Although I have never been so fortunate as to see the work done, residents of this locality with whom I have talked say that the birds "hammer the acorns in good and hard." The tight fit of many, though not all, of the nuts is in keeping with this statement.

The other fact which enables me to know now the age and storage time of the acorns examined in July, 1919, comes from my observations this, 1920, autumn. On visiting the trees October 18 and 19 this year, I found that practically the entire acorn crop of the season had either dropped to the ground, where the nuts were abundant under many trees, or had been gathered by the birds, squirrels, etc. Very few indeed were found on the trees. By comparing the condition of these new acorns with that of those taken from the storage trees in July, 1919, and that of those which had lain on the ground over a winter, it became clear that, as already said, the nuts examined in July were stored during the early fall of the year before, that is, of 1918.

The other significant fact brought out by the July examination was the prevailing freedom of the nuts from "worminess" and their generally excellent state of preservation. Few indeed of the many nuts opened contained either eggs or grubs of the nut weevil which typically infests the acorns of this region. The significant thing about this fact is that, taken along with the known developmental career of these weevils, we are able to see clearly that if the birds were going to utilize this year's stores for food, not grubs but the meats of perfectly good acorns would almost certainly have to be eaten. This would not be in accordance with a widely held theory as to what the acorns are stored for. According to this theory it is grubs and not acorn meats that the birds want. The conclusion my observations lead to, on this point, will be given presently.

February 8, 1920, was the date of my next visit to the trees, this time in company with Professor C. Judson Herrick of the University of Chicago. That the acorn stores were being drawn upon by the birds for food, was the most striking fact which met our view, as we came to the storage trees one after another. Although we were not fortunate enough to catch any of the birds in the act, what they had been doing was clear enough, speaking generally, by the marks they left, especially around some of the trees. These marks consisted of quantities of litter on the ground around the bases of the trees, this consisting of acorn shells and bits of bark from the trees. Examination of the shells told much of the story of woodpecker dining methods when acorns are the chief food. That it is at least very common for the nuts to be taken whole from the storage places and opened either on the ground near the tree or in the branches of the same tree, is manifest from the numerous instances in which the nuts were opened on the side, the opening frequently being relatively small and quite regular of outline. Such openings could not, of course, be made while the nuts are close-fitted into the storage holes. But even when



the shell leavings were proof that the opening process consisted more in tearing than puncturing, the pieces were of such form as strongly to suggest that the nuts were operated on after having been taken from the holes. Not many empty shells were found in situ, or even in the litter, opened at the butt, as would generally have to be the case had they been opened before extraction from the store-holes. These and later observations effectually disprove the theory that the holes are used by the birds as a sort of vise for holding the nuts in order that they may be opened.

Another fact brought to light by examining the shell litter was that most

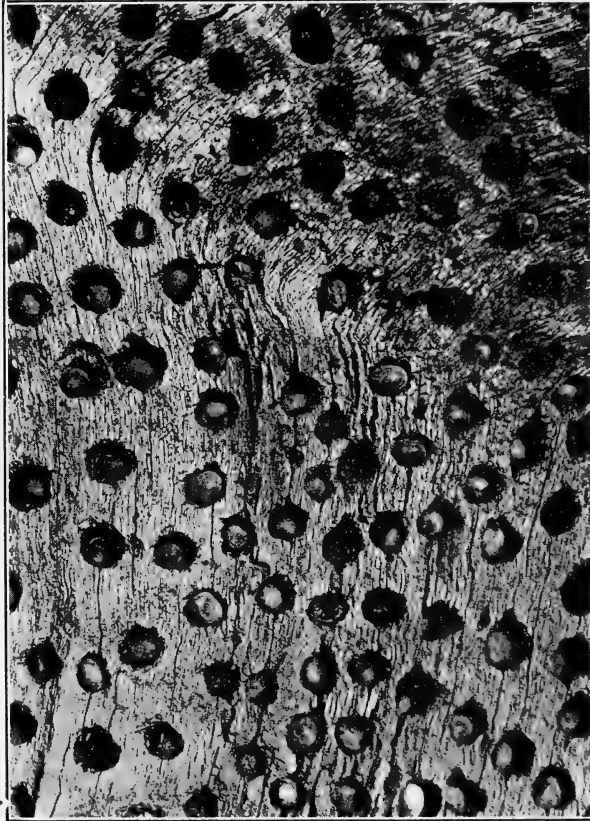


Fig. 2. PEBBLES INSERTED IN ACORN-PITS; SUPPOSED TO HAVE BEEN DONE BY CALIFORNIA WOODPECKER; PART OF SPECIMEN IN MUSEUM OF VERTEBRATE ZOOLOGY PROCURED ON SONOMA MOUNTAIN NEAR SANTA ROSA, CALIFORNIA, IN MAY, 1913, BY GEO. P. MCNEAR.

of the nuts which had been opened so far this winter were grub-containers. This was easily recognizable by the excrement, etc., of the grubs still clinging to the inner surfaces of the shells. The clean inside of the shell of a grubless nut as compared with the dirtiness of a grubby shell makes it possible to recognize at a glance even as to rather small pieces of shell, whether the nut was "wormy". Furthermore, examination of many acorns still in the store-holes, found many more "sound" than "wormy" ones. The impression gained from the examination at this time was strongly to the effect that while the birds

were opening some grubless acorns, they were really after the grubby ones. For instance a few cases were noticed where sound nuts had been opened, but where the meat was still in place—as though the bird had opened the nut in the expectation of getting a grub, had recognized its mistake, and had then discarded the nut. But systematic, quantitative study of nut remains through a winter would be necessary to prove such a selective process of food consumption as is here indicated.

On this visit some attention was given to the hole-drilling itself. One tree in particular contained a considerable number of perfectly fresh acornless holes, some of which were completed while others were in various stages of advancement. That these had really been only recently made seemed highly probable. But if so, wherefore had this been done, the storing period for the season having ended some four months ago? I have seen no indication that acorns are garnered at any other time than in early fall when the crop is freshly ripe.

Another observation at this time was suggestive of an answer to the question just asked, this observation tending to confirm the occasionally expressed surmise that the hole-drilling is not primarily for acorn storing but is an incident to the bird's pursuit of insects in the bark itself. An instance was found of a dead pine, the bark of which showed many small holes made by an insect, probably. Some woodpeckers, presumably the California, had been prodding the bark of this tree almost certainly after the insects responsible for these minute holes. Although in some cases the woodpecker work was rather diffuse, and quite unlike the clear-cut acorn storage holes, in other cases the perforations were quite similar to those made for acorns.

Assuming, now, that this bark puncturing was done by the California Woodpecker (which, however, is not quite certain), an instance is furnished which might be interpreted as reminiscent, so to speak, of the bird's original purpose of hole drilling. Though very fragmentary, this observation was sufficiently suggestive to warrant considerable effort at extension. But the circumstances under which this mid-winter visit was made were such as to preclude the possibility of following the point farther then. On later visits a few additional facts were observed bearing on the general question of hole drilling. These will be presented in due course.

My next visit was on June 7-9, 1920. Several of the trees from which the acorns had been partly used in February, were now almost entirely acornless, not even empty shells being left in the holes, excepting here and there. Examination of shell fragments in the litter furnished evidence that the meats of sound nuts had now been used as well as grubs from "wormy" ones, this evidence consisting in applying the criteria already mentioned as to shell remains of sound and wormy nuts. Many shell pieces, some of them half shells or even more, were seen containing no remnants of meats, but likewise no tracts of worm leavings. The meats had surely been removed, in all likelihood, by the woodpeckers, and for food. But certainty, on the last two points, was impossible since my efforts to catch the birds in the act were as little successful on this as on previous visits. It is, of course, possible that sound nuts opened by woodpeckers and cast aside when found to contain no grubs, may have been deprived of their meats by other animals, as mice or rats. However, ample indirect evidence of the sort here indicated, coupled with the direct evidence afforded by examination of stomach contents (Grinnell and Storer, Yosemite

Report, MS) makes it all but certain that the woodpeckers make extensive use of the meats of sound acorns as well as of grubs of wormy ones.

But, while some of the storage trees were completely emptied of nuts, tree A (so designated in the account of my July, 1919, visit), and the others of its group, had hardly been drawn upon at all. The acorns were in place much as they had been since stored away in the fall of 1918, and there was almost none of the litter on the ground around the trees which was so abundant around the emptied trees a half mile away.

Now, indications of weathering of the exposed ends of the stored acorns

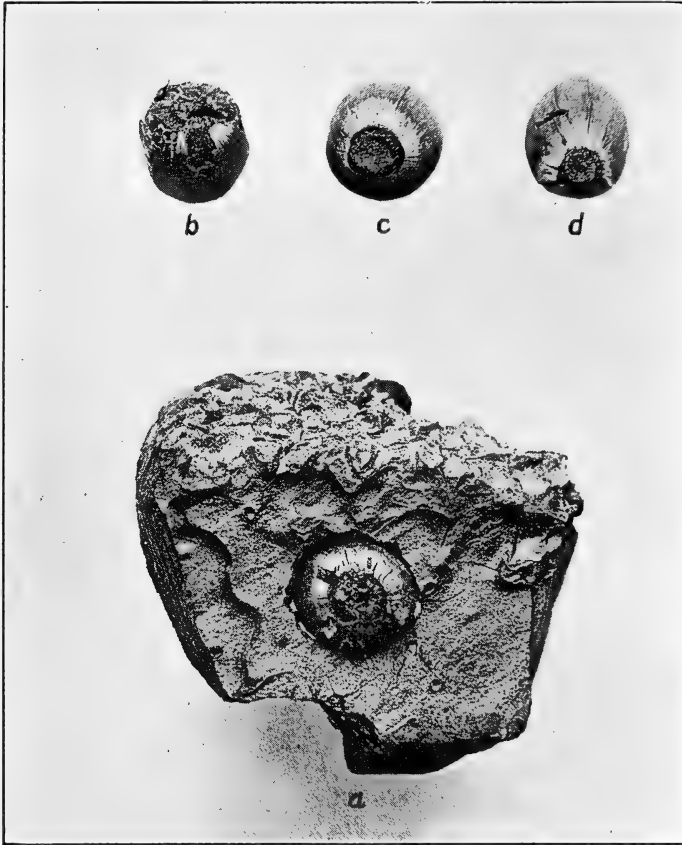


Fig. 3. *a*, BLOCK OF BARK, JEFFREY PINE, WITH ACORN IN PLACE, SHOWING CLOSE FIT, BUTT OUT, AND OLD AGE OF ACORN AS INDICATED BY WEATHERING; *b*, *c*, AND *d*, ACORNS TAKEN FROM HOLES, THREE STAGES OF DETERIORATION (*d*, *c*, *b*) FROM AGE AND EXPOSURE.

(previously noticed, but only cursorily) attracted my special attention. Such indications consist in a bleaching of the shell and a fine cracking of its surface. Following this intimation as to the keeping qualities of the acorns. I opened many sound nuts to see if the meats were showing signs of age. Without exception the meats thus examined were much darker in color than are those of fresh nuts. In many cases the color was a decided brown and in some this had advanced well toward black. The impression one got was that unless

these acorns were utilized before long they would be "spoiled". What had happened in this regard at the end of another four months will be seen presently.

At this time attention was given to the suggestion gained on previous visits as to the hole-boring business itself—as to its origin and extent. The suggestion made by a single observation on the February visit was, it will be recalled, that pursuit of insects in the bark itself might be the inception of the habit. But such following up as could be made, of the clues then obtained, yielded no additional affirmative evidence on the point. Indeed it tended to disprove, if anything, the insect hunting hypothesis. For example, a few other dead pines were examined, the bark of which was thickly punctured with the small insect holes, but these had elicited no hole-picking by woodpeckers. In fact, so abundant was the evidence of insect life in and under the loose bark of one of these trees, that it struck me as rather surprising that woodpeckers had not made use of it in any way so far as could be judged.

But even if true that pursuit of bark-inhabiting insects were the original impulse to hole-drilling by the woodpeckers, almost certain is it that now the habit has little or no reference to its original purpose. I examined several holes during this visit, which had been very recently made in the healthiest, most perfect of bark of Jeffrey and Coulter pines. If the birds were after insects in these instances they certainly could not have been worse fooled as to where prey might be found.

And this observation raised again the question of the effectiveness of the habit. Recalling that the time was now June, a period when no acorns are available for storing, we should be obliged to suppose that these recently drilled holes were made in anticipation of the next crop of nuts still some three months from ripe. Perhaps it is permissible to reason that since there is a measure of foresight in storing the acorns, there may also be something of the same sort in making the holes. Why not the holes as well prepared some months before they can be filled, as the acorns stored some months before they are eaten? The question is a fair and interesting one and involves the further question of the specificness of the entire group of instincts involved. Does each bird make its own holes, and collect and store its own acorns for its own use? Or is the entire performance a generalized one, one, that is, in which hole-drilling, nut-storing, and nut-eating are all rather indiscriminate for the birds of a given locality?

So far as I know, absolutely no direct evidence is available on which to base answers to these questions. But from our general knowledge of bird instinct, it is highly probable that the operations are of the generalized type. Several of my observations are confirmatory of this view. Those on off season drilling are most readily interpreted from this standpoint. I revert to the point shortly.

Another observation made during this visit bears on the question of whether all holes made are actually used for storage. One tree in particular presented conditions in the height distribution of the stored acorns which seemed to have such a bearing. This was the circumstance that a distinctly larger proportion of the holes toward the base of the trunk contained acorns than did those up toward the middle of the trunk. By examining the higher parts of the trunk with glasses one could easily see that acorn-containing holes thinned out on going upward considerably more rapidly than did the holes



themselves. The impression from this was that while hole-drilling had been as conveniently and largely done high up as low down on the trunk, nut storage, since probably done for the most part, as previously seen, from nuts gathered on the ground, had been more convenient and so more practiced on the lower portion of the trunk.

On this visit the stub of a long-dead, bark-denuded oak, probably a black oak, was examined, which was used by the woodpeckers as a granary, though

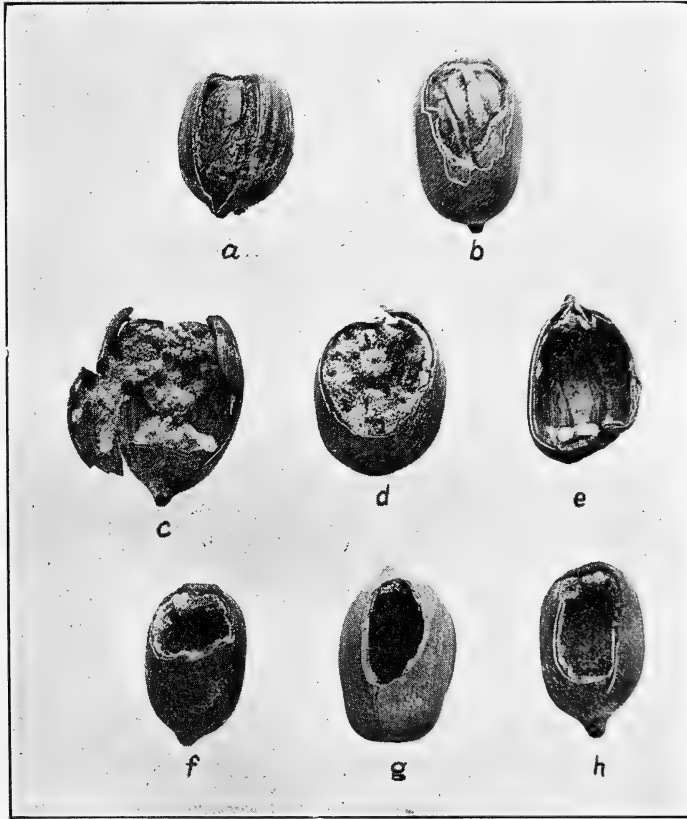


Fig. 4. *a*, A SOUND MEAT BUT NEARLY BLACK FROM AGE (HAD BEEN IN HOLE ABOUT 20 MONTHS); *b*, A SOUND MEAT HARDLY DARKENED AT ALL (HAD BEEN IN HOLE OVER ONE WINTER); *c* AND *d*, SHELLS CONTAINING WORM LEAVINGS, BUT WORMS GONE; *e*, SHELL, FROM WHICH A SOUND MEAT HAD BEEN TAKEN—NO WORM LEAVINGS; *f*, *g*, *h*, SHELLS OPENED ON THE SIDE; THE OPENING OF *g*, ESPECIALLY, IS SO FAR TOWARD THE TIP THAT IT COULD NOT HAVE BEEN MADE WHILE THE ACORN WAS IN PLACE IN THE BARK.

a majority of the holes contained no acorns and there was no evidence around the tree of recent acorn consumption. One of the most striking things here was the relation of the holes to cracks in the wood. In many instances a row of holes, some mere beginnings, followed, and were made as local enlargements of, a crack. Some of these holes contained acorns and some did not. Again, acorns had in some instances been placed in larger cracks where no drilling

had been done. Such a case readily suggests that the hole-drilling habit may have been connected originally with the habit of probing cracks and other natural cavities in dead trees while searching for insects. But since there were probably more holes in this tree not connected with cracks than were so connected, but were in the solid wood, we may suppose the crack-probing instinct being a generalized one, easily over-flowed as one might say, first to produce the hole-drilling habit in solid wood of the same dead tree, and afterward to the bark of live trees containing no cracks.

And by a parallel development the present acorn storing habit may have been perfected. At the beginning this may have operated only in using cracks and decay cavities, in dead trees for storing, but later extended to the drilled holes of the same trees, and later still to those drilled in the bark of living trees.

Conclusive evidence that nut-eating rodents (squirrels, rats) prey upon the acorns stored by the woodpeckers was first obtained on the present visit. Two trees were found on which the bark immediately around acorn holes had been gnawed by rodents, as unmistakably proved by the tooth marks. The acorns were gone from some of these holes, but not from all, thus showing that the marauders had failed in some of their efforts.

Squirrels (the Anthony Gray Squirrel) and rats (Southern Brush Rat) are both common hereabouts, and one or the other of these was in all probability the culprit. This observation clearly indicates an advantage in counter-sinking the nuts, as one may say, in the holes, and also in "hammering them in tight". With a little care and extra work the nuts could be so stored as to protect them pretty effectually against rodent pillage. And to a great extent, though by no means wholly so, as we shall see later, the storing realizes this protection quite well.

The next trip to the locality was planned with reference to the harvest time for the acorn crop of 1920. October 18-19 was the date on which it was made. The crop seemed to have been only moderately good this year. This was indicated by the fact that almost no nuts still remained on the trees, that very few were on the ground under some trees, though under many others a fairly generous number were present, and finally that while a goodly number of the storage trees had been moderately stored with fresh nuts, several of those most richly stored last year had received none or only a few this year—though, of course, the season was not far enough gone to make it impossible that more garnering would yet be done.

Attention was again given to the two trees having many holes but no nuts, mentioned in connection with previous visits. As before, neither of these contained a single nut or any other signs of having been recently worked at by the birds. Since this makes the third consecutive season in which these trees have been observed to be unused, it looks as though they are wholly abandoned. The general appearance of desertedness of one of them especially favors this conjecture.

The group of trees of which storage-tree A is one, presented the most interesting facts this time. These were now quite as heavily stored as when first seen, July, 1919, but not more than one-half of the nuts were of the 1920 crop, and very many of them were clearly the same as those seen on the first and all the intervening visits. The state of weathering of nuts, previously mentioned, was the decisive pointer to this conclusion. The darkened condition of the sound meats of the old nuts, referred to in connection with the visit of June,

1920, had now gone so far that many of the meats were thoroughly black. And besides, they now showed other clear evidences of deterioration. For one thing, they were more brittle than before. That they were well on the road to disintegration was clear. If not already beyond serviceability as woodpecker food, they surely soon would be if left unused. But with the new crop at hand and upon which the birds were already feeding, why should these old decaying nuts be eaten? Here was a store of several thousand acorns (6,000, say, in tree A alone—see estimate on previous page) destined to great if not complete loss. For even if consumed at once the old nuts could be of small food value as compared with the new ones.

A fortunate circumstance made possible an observation at this time which is probably significant as bearing on the spoiling of the acorns. A hard rain, which had been in progress all the night before, was falling while I was examining these particular trees. As a result of the downpour the acorns were thoroughly wet, the old ones especially being in a genuinely "water-logged" condition. Such soakings of the acorns as this must hasten their deterioration, especially since they are badly circumstanced for drying out.

I was considerably surprised this time by noticing that many of the newly stored acorns were protruding from the holes—not infrequently as much as a quarter or even a half inch. Although my attention had not before been drawn to the point, I am quite certain that I have never before seen acorns so much exposed. Indeed, as a rule, they are, as previously mentioned, more likely to be sunk below the surface of the bark than to project above it.

The point is significant as bearing on the exposure of the nuts to the depredations of squirrels and rats. Hundreds of the nuts of this year's harvest projected enough from the holes to make them easy plunder for the rodents; whereas as previously pointed out, when the nuts are counter-sunk, it is no simple thing for the marauders to get at them. Query: Is it possible that the absence of nuts projecting from the holes, as the rule is, is due to the fact that those left projecting when the new crop is garnered are soon taken by the robbers? Only much more observation than we now have on the actual performances of both woodpeckers and rodents, can answer this question. In the meantime what we can say with certainty is that many acorns are so stored as to be easily accessible to rodents\*.

#### SUMMARY

Our observations and reflections on acorn storing by the California Woodpeckers in the Cuyamaca region, having now been presented as a running narrative, the main results may profitably be summed up in a few brief statements.

1. The storing habit of this woodpecker is an important element in the bird's solution of its food problem, both the grubs contained in many of the acorns and the meats of sound acorns being utilized as food.

2. There are indications that grubs are the chief objects of consideration and are eaten first after the new crop is garnered, while the meats of sound

\*Mr. Frank Stephens (*California Mammals*, p. 88) mentions that although the Anthony Gray Squirrel does not hibernate neither does it seem to "store up much food for winter use". Can it be that pillage of acorns stored by the California Woodpecker is a real factor in enabling this squirrel to live without either hibernating or food storing? The question certainly deserves looking into carefully.

Since the above was written the Museum of Vertebrate Zoology has received a piece of trunk of *Q. douglasii* (fig. 1) from near Gilroy, Santa Clara County, California, in which acorns of the same oak are stored, many of which protrude as did those described above. This specimen was taken in October, 1920, and as the acorns are of this year's crop, not much time could have elapsed in which they could have been preyed upon by other animals. However, gray squirrels are said not to inhabit this locality. Consequently the nuts would not be in danger from this animal at least.

nuts are mostly eaten after no more wormy acorns remain in the stores. But the observations pointing in this direction are too scanty to prove the suggestion.

3. The acorn storing operation is seemingly confined to a rather brief period immediately following the ripening of the acorns each year. The nuts seem to be picked up mostly from the ground soon after they have fallen, though they may be taken from the trees to some extent. The acorns used in this locality are chiefly those of the black oak, *Quercus kelloggii*.

4. Although the entire store, consisting of several thousand acorns on some storage trees, may be used up during a season, it may also happen that thousands of sound nuts in other trees are left unused and spoil from weathering and other destructive processes of nature.

5. Suggestions as to the origin of the hole-drilling part of the habit are found in the way holes are sometimes still connected with cracks in the wood of old dead trees. Also there is some indication that hole-drilling in the bark of pine trees was originally done in pursuit of insects inhabiting the bark itself. The fact that acorns are sometimes placed in cracks and decay cavities of dead trees suggests that this sort of storage may have preceded and led to storage in holes made expressly for the reception of the nuts.

6. But whatever may have been the origin of either the hole-drilling or the nut-storing habits, there can be no doubt that now the holes in the bark of living pine trees at least are mainly purposeless except as storage places for acorns, and that nearly all the storing is in holes made for no other purpose.

7. The acorns stored by woodpeckers are subject to plunder by nut-eating rodents, presumably squirrels and possibly brush rats.

8. As to what light these observations throw on the general problem of the efficiency of instinctive activity, the following conclusions seem justified, the facts here presented being taken along with others made known by other observers.

(a) As to hole drilling: While the holes are made expressly for the reception of acorns, many holes are probably made which are never used, holes are made at seasons of the year when there are no acorns to store, and large numbers of perfectly serviceable holes seem to be abandoned even in localities where both birds and acorns are abundant, and new holes are being made.

(b) As to the storing business itself: While this is of distinct service to the food necessities of the woodpeckers, the instinct sometimes goes wrong to the extent of storing pebbles instead of acorns, thus defeating entirely the purpose of the instinct. Again, large numbers of acorns are sometimes stored, the use of which is so long delayed that the acorns become wholly or largely unfit for food, and this in places where the bird population seems normal. Finally, acorns are sometimes stored in such fashion as to make them easy prey for marauding rodents, when with some definite foresight and a little more work such exposure could easily be largely avoided.

(c) From the facts, and the conclusions based immediately upon them, it seems justifiable to conclude finally that the acorn-storing habit of this woodpecker, though having much of specificality about it, is still at bottom a rather generalized one and perhaps on this account frequently exhibits serious maladaptations.

*Scripps Institution for Biological Research, La Jolla, California, November 19, 1920.*

## SUGGESTIONS REGARDING THE SYSTEMA AVIUM

By RICHARD C. MCGREGOR

THERE IS NEED of a good check list of the birds of the world. The lists now available are out of date, and for other reasons none of them was ever satisfactory for general use.

A world list should include features that are not found in any list so far issued. Of first importance is the sanction of an international body, so that the ornithologists of all nations will feel a personal interest in the publication. It is therefore necessary that an international body adopt rules of nomenclature that will be acceptable to the majority of working ornithologists. The various groups should be willing to compromise their differences of opinion on minor points for the sake of uniformity in nomenclature. The usefulness of Sharpe's Hand-list is injured by slight differences between the American and the British rules.

Of next importance is the selection of a small representative committee that shall prepare a list with reasonable speed. A large part of the list can be made from existing lists and from monographic works. Little time should be spent upon the validity of newly described species, but they should all be included. When reasonable doubt as to the validity of a species exists, its name might be included in the synonymy, printed in distinctive type or indicated by a conventional sign. Completeness and speed in the preparation of such a list are far more important than final decision with regard to species based on slight or imaginary characters.

To win the place that it should have and hold, our list must be well handled typographically. Dubois's list is well prepared in some ways, but its usefulness is almost destroyed by the poor selection of type faces and the cumbersome size of the page. Sharpe's list avoids these bad features, but is injured by the maddening arrangement of its indices and by the lack of references. The first part of Mathew's list of Australian birds, in *Birds of Australia*, is confusing because of his method of treatment of subspecies.

A convenient type measure is 24 by 40 picas, printed on paper of 6 by 9¼ inches. This is the size of the Check-list of North American Birds. A little larger type page, such as that used for the Proceedings of the United States National Museum and many other United States Government publications, might well be used. This page measures 26 by 46 picas on paper of 6 by 9¾ inches, untrimmed. The paper should be light and thin, so as to reduce bulk and weight. The matter of type, both as to size and face, should receive careful consideration. Accepted names of species and genera should be printed in a heavy-face type. Gothic type is very clear, but is somewhat too harsh and stiff for our purpose. Clarendon is often used, but in the usual fonts is too much condensed. Antique seems to me the most suitable face for generic and specific headings, and is the most pleasing mate for standard roman.

The names of species and the notes on distribution should be set in 8 point type, synonymy in 6 point, both leaded, with extra space above flush lines. The use of these small type would save much space, and as more names would appear on each page, a required name would be more easily found.

Generic names should be repeated before their respective specific names, as in the American list; this is a great help, especially in large genera in which

the species run over from one page to another. Serial numbers for families, genera, and species, as in Sharpe's Hand-list, seem to be of no value whatever. A continuous series of numbers for all species, as in the American list, is convenient for marking eggs and in making lists of exchange specimens. Additional names can be numbered by the decimal system.

The value of our world check list will be much more increased, if it contain some synonymy for each species. This synonymy should include reference to the original description or basis of the name; reference to the accepted combination, if different from the original; reference to a few monographic works or faunas containing full synonymies—for example, the Catalogue of Birds of the British Museum and Ridgway's Birds of North and Middle America; reference to a good plate or to such other illustration as exists. The synonymy for most species would not run over two or three lines and would seldom be over six lines. The information contained therein would be well worth the space.

In Sharpe's Hand-list there are approximately 22,000 genera and species, listed on 2,066 pages in five volumes. It ought to be possible to put the world list, including the index, in five volumes of 500 pages each. The pagination should be continuous, so as to simplify the indexing.

I am disappointed to notice comment to the effect that a new edition of the Check-list of North American Birds is to be prepared "which should constitute the nearctic volume of the proposed 'Systema Avium' to be gotten up by the B. O. U. and the A. O. U. jointly." This idea does not at all fit my conception of what is needed. We should have one check list to include all the genera and species of the world in systematic order, so that one list will come to be used by ornithologists the world over.

The members of a national organization, such as the American Ornithologists' Union or the British Ornithologists' Union, probably think that it is beyond the province of their society to consider the status or the nomenclature of exotic species of birds. If this be true, and I do not undertake to contest it, then there is need of an international society or committee that shall consider the nomenclature of the birds of Timbuctoo with the same interest as that of the birds of the San Francisco Bay region, the District of Columbia, or the British Isles.

The interest of the student should not stop at an international boundary line. That a species is not known to occur north of the Rio Grande is a poor reason for barring a specimen from the cabinet of an American ornithologist. However, the American list tends to bring about this absurd discrimination against all foreign species to the detriment of the individual student. In other words, the majority of American ornithologists are extremely provincial with regard to birds. Fortunately Mr. Ridgway's stupendous work on the birds of North and Middle America and the activity of a few other Americans in their study of South American birds will help to break down this artificial barrier.

European ornithologists seem to have been keener in the study of exotic faunas and floras than have Americans. With the British there have been two very efficient causes leading to this condition. In the first place the birds of the British Isles had been studied and named for years before there was an ornithologist in North America. In the second place Britain's overseas territorial interests have thrown English naturalists into exotic fields, and their collections have helped to build up the magnificent series in the British Mu-

seum of Natural History and in the National Herbarium at Kew.

Another factor in developing a cosmopolitan interest among British ornithologists has been the Catalogue of the Birds in the British Museum. In this enormous work all of the specimens of each species in the British Museum were listed, and so its title is justified; but fortunately the catalogue not only lists the specimens of birds in the British Museum, but also gives synonymies and descriptions of all known species. This series of volumes must have been a great influence in attracting donations of specimens to the British Museum.

The publication of the Catalogue of the Birds in the British Museum unavoidably took many years—the first volume was out of date and out of print before the final volume was issued. Sharpe's Hand-list remedies this to a certain extent. With the aid of the Zoological Record and other review publications it is now reasonably easy to keep posted on the new genera and species as they are described. In this connection the reviews in the leading ornithological journals are important, and it should not be forgotten that the review section of the Auk is one of the most accurate in recording new generic and specific names.

Sharpe's Hand-list, through motives of economy perhaps, is not nearly so useful as it might be. Here is a list reduced to almost its lowest terms so far as information goes. With better typographical arrangement it could have been printed on fewer pages with no loss in clearness. Its gravest defect is the lack of primary references. For nine-tenths of the generic and specific names Sharpe gives no other reference than the Catalogue of Birds; for names of more recent date, the original references are given. To add to the difficulty of locating the subject of search in the index, each volume has separate pagination. Dubois produced a two-volume list with continuous pagination and primary citations for species. In spite of these advantages the large page of the Synopsis Avium has probably prevented its more general use. Aside from Sharpe and Dubois, no one has attempted a world list in recent years.

If such a work is to be printed, it should be completed and placed on sale with reasonable expedition so that it can be used. It is impossible to get a list of this sort so that it will suit everyone. Probably we shall never agree as to the limits of *Larus*, *Charadrius*, *Ochthodromus*, *Anas*, *Tringa*, *Ammodramus*, *Lanius*, *Ptilopus*, and dozens of other genera. Let the committee steer a middle course and neither a lumpner nor a splitter be, for in this way will the need of the greatest number be served.

An international committee might take such a list as Sharpe's, revise the nomenclature and distribution notes, add synonymies and new species, and thus produce something that all the world could use.

Of course such a list would be imperfect and would contain many mistakes, but it would give us some confidence in the names accepted, which cannot be said of some of the numerous genera and subspecies that have been described in various publications. I do not mean that I object to the discussion and description of new genera and species. However, it is often impossible to judge of the validity of these new forms. Here is where a committee on nomenclature has its field of action. If I have the necessary specimens, I can satisfy myself as to the validity of the new forms proposed and will accept or reject the names as I think best. As the matter stands, however, one author unites several genera that have been long recognized, and another separates them again and creates a few new generic names. In such a case, lacking suitable material



for several of the species, I am at a loss to know which author to follow. If a committee that has a reputation for good judgment and fairness passes on the case, I will follow its ruling.

The American Ornithologists' Union Committee rulings do not always agree with my ideas, but were I writing on United States birds I would follow the American Check-list.

The Union has furnished an immense stimulus to the development of ornithology in the United States and has been a drag on wild and unreasoning publication. It does not seem impossible that an international union or committee could exert a similarly desirable influence on systematic ornithology in all countries.

Another salutary effect of an international list would be to show local students that some of the genera with which they are familiar contain related species in neighboring countries.

In the Manual of North American Birds and in the Birds of North and Middle America, Ridgway includes some species on the above basis; this should be considered a highly commendable feature of this author's remarkably thorough work. The preparation of the manuscript for such books involves an immense amount of study of related species, and Mr. Ridgway fully realizes that the study of birds should include all birds, not only a lot of species selected because of geographic or political divisions. Although, because of mechanical considerations, the species treated in one work must be limited in some way, every opportunity should be given the beginner to realize so far as he can the relation of his local species, genera, and families to those of the world at large. Few of us could afford to possess the twenty-seven volumes of the Catalogue of Birds, even were none of them out of print or out of date; but a useful check list of the birds of the world could be sold at a price within the reach of many students. Such a work would go far to dispel the provincialism of which I complain and would bring about a better understanding and a greater spirit of coöperation among the ornithologists of the world.

It is easy to describe the kind of list that one would wish to see published, but its preparation involves an immense amount of labor by the men who are generous enough to undertake it.

*Bureau of Science, Manila, P. I., October 14, 1920.*



## A HUNTER'S NOTES ON DOVES IN THE RIO GRANDE VALLEY

By ALDO LEOPOLD

SINCE 1917 I have kept a record of weights, food, plumage, habits, and percentage of squabs of about 400 Mourning Doves (*Zenaidura macroura*) killed during the hunting season in the central Rio Grande Valley near Albuquerque, New Mexico. The data has been plotted to show percentage of squabs killed at weekly intervals from August 16 to December 15, and also the average weight, old birds and squabs separately, for the same period. The data is as yet insufficient as a basis for smoothed curves, but it is sufficient basis for tabular expression as follows:

Date	Percentage of squabs	Weight old birds	Weight squabs
Aug. 16	10%	-----	-----
Aug. 23	15	-----	-----
Sept. 1	55	4.4 oz.	3.7 oz.
Sept. 8	60	4.3	3.6
Sept. 15	50	4.2	3.5
Sept. 23	50	4.2	3.4

The table shows first of all that there are few squabs abroad on the shooting grounds until September, and that therefore the old opening date of August 16 was too early. It shows that the present opening date of September 1 is biologically correct. The explanation of the rapid increase in squabs about September 1 appears to be as follows: The main crop of squabs stays near the nests in the cottonwood bosques and in the foothills, until well grown. The adults, however, make long flights to wheat stubble, where most of the August shooting used to be done. This August stubble shooting was wrong, because it killed mostly birds with dependent young.

The table shows secondly that after the main squab crop has issued forth, the young birds are just as numerous, or slightly more so, than the adults. *The yearly increase is therefore about 100%.* This conclusion is nearly inescapable, because there are no other factors that I know of which would prevent the proportion of squabs in the bag from pretty accurately reflecting the proportion of squabs in the whole dove population. The only possible sources of a differential proportion of squabs would be: (a) Selection in shooting. Nearly all these birds were killed in pass and jump shooting, and the young birds are practically as hard to hit and to kill as the old ones. (b) Wildness. The squabs may "lay" a little better than the old birds, but on the usual clear days in normal cover both lay good enough to prevent an abnormal percentage of squabs in the bag. (c) Distribution of young and old birds. The data covers a wide variety of sites, seasons, hours, feeds, etc., and there could be no differential from these sources. (d) Differential migration. The general accuracy of the conclusion above stated could be impaired only by assuming a differential migration of young as compared with old birds. There is some evidence to show that the grown squabs of the main crop go south before the late squabs and old birds (see decrease in average weight of squabs and percentage of squabs during September). However, to admit this as material to the question of yearly increase would raise rather than lower the estimated annual increase of 100%, and it seems nearly incredible that a bird which lays only two eggs could more than double its numbers each year. In fact, even the 100%

increase implies a high percentage of second broods and re-nestings. That second broods and re-nestings are common is strongly indicated by the evidence available. For instance, I found a dove brooding eggs near Tucson, Arizona, on September 1, 1916; I have also found numerous eggs and fledglings near Albuquerque in August. Many very small squabs are killed very late in the season.

The table shows that the weight of old birds decreases slightly after September 1. This is probably accounted for by food habits. As already stated, the old birds congregate on the wheat stubbles in August and there fatten rapidly. But these stubbles are generally plowed under about September 1, at which time the birds move to the doveweed patches along the foothills, mesas, and other sandy ground. The seed of the doveweed (*Psoralea*, sp.?), is preferred above all other food, except possibly wheat and beeweed (*Peritoma serulatum* and *P. breviflorum*). However, during backward years the doveweed seed is often not matured by September, and the birds must seek the hottest banks to find mature seed. In any event, feeding on doveweed requires more work and longer flights to water, which probably accounts for the loss in weight. During the winter the few birds that remain are found in wild sunflower patches, where they eat sunflower seed, or around old strawstacks, where they pick up waste wheat. During pinyon years doves are very fond of pinyon nuts. J. F. Mullen counted 60 nuts in one crop and H. B. Hammond counted 72 in another. Pinyon nuts occur only at three or four year intervals.

The decreasing average weight of squabs shown by the table is plainly due to the fact that as the birds grow scarcer in September, the hunter must seek his birds instead of waiting on a flyway, or flush-shooting a doveweed patch. In doing this he hunts groves and trees, thereby killing many small late squabs not yet big enough to migrate. Such few big squabs as are killed during the later part of the season weigh nearly as much as the old birds; in fact, by November, squabs are mostly indistinguishable from adults.

The dove has several habits, as a game bird, which I have never seen described in print. High, fast-flying birds, especially on a stormy day, may often be induced to pitch down and light by firing a shot at them. A dove merely winged will fall down and walk away, but will not seek cover like other wounded birds. A dove with body wounds will not even walk. A certain kind of wound (probably lungs) results in the bird flying away and alighting on the ground or in trees in nearly natural manner, but when found the bird is stone dead. This manner of death is much commoner with doves than with any other game bird I know of. Many hunters do not watch their "missed" birds carefully, and this accounts for the large number of dead doves found on the shooting grounds. Head shots tower spirally, with sudden collapse, like quail.

What are the doves' natural enemies? I do not think they have as many as quail, else they could not double yearly on two eggs, but I think hawks get quite a few. On November 23, 1919, near Tome Hill I saw a Sharp-shinned Hawk (*Accipiter velox*) catch an apparently healthy grown dove in a cornfield. I killed the hawk, and found the fresh blood and dove feathers on his claws, but could not find the dove. Two or three Marsh Hawks wheeling over a doveweed patch will sometimes flush many birds and cause them to flee to trees, but one Marsh Hawk does not worry them much. I never saw a Marsh Hawk actually pursue a healthy bird.

The dove is a temperamental bird. On certain days the doves do not feed,

but gather in trees and just sit around. On such days all birds show a decreased weight, doubtless directly due to empty crops. When scattered over the open mesas feeding on doveweed, a rainy day interferes with their feeding. They simply sit around under the lee side of bushes, keeping dry. Nevertheless they make their regular evening flight to water although it would seem easy to gather the necessary water off the stems and leaves of plants. On such days the birds killed on the flyways to water show decreased weight due to empty crops.

The daily flight to water generally starts between 3:00 P. M. and 4:00 P. M. and reaches its height just before dark. Sometimes, where long distances must be traversed, the birds do not arrive at water until after dark. When the wind parallels the water flight, the flight going and coming will be at different levels; for instance with the wind blowing toward water, the birds going to water will fly high and with tremendous speed, while the birds beating their way back against the wind will fly so low as to be nearly hidden by ordinary sage-brush. Some hunters take advantage of this and shoot only the easy birds beating into the wind.

The dove's choice of watering places is peculiar. In the hills they like springs, stock tanks, and open sandy creeks. On the Rio Grande bottoms they use waste irrigation water spilled along open roads, grassy vegas provided the cover is short, and ponds with bare shores. It is generally supposed that they seek freedom from cover which might harbor natural enemies, but if this is the main factor governing their choice of watering places, then the shallow rills on the big open sandbars of the Rio Grande ought to suit them exactly. But I have never seen a dove light on a river sandbar. Here is an interesting problem to solve.

Many doves are killed yearly in New Mexico but no decrease in numbers is noticeable. The area adapted to doves is so enormous that the total population is probably very little affected by localized shooting.

*Albuquerque, New Mexico, October 13, 1920.*

## CONCERNING THE STATUS OF THE SUPPOSED TWO RACES OF THE LONG-BILLED CURLEW

By JOSEPH GRINNELL

(Contribution from the Museum of Vertebrate Zoology of the University of California)

**I**N THE FALL of 1918 vertebrate collecting was carried on by a party from the California Museum of Vertebrate Zoology at Morro, San Luis Obispo County, California. Among the birds of interest obtained there was the series of Long-billed Curlew listed in the table presented farther along in this paper. The acquisition of so many specimens (fifteen) of this Curlew, taken from one locality and within a period of less than one month in a single year, seemed to afford ground for looking into the standing of the recently proposed two races of the species, namely *Numenius americanus americanus* Bechstein and *Numenius americanus occidentalis* Woodhouse. This separation was first pro-

posed by Bishop (Auk, xxvii, 1910, pp. 59-60) and was subsequently upheld by Oberholser (Auk, xxxv, 1918, pp. 188-195) and by Ridgway (Bds. N. and Mid. Amer., pt. viii, 1919, pp. 390-395). There is some question as to the name to be employed for one of the supposed races (*parvus* of Bishop versus *occidentalis* of Woodhouse), but this is a matter outside of the purpose of the discussion in the present contribution. I am here enquiring as to the nature of the variation I find in the series of Curlew from the one place in California. Is there represented geographic variation, in other words subspecific variation, as well as individual and sexual variation?

Referring further to the material under scrutiny: All the birds are in comparable plumage, as far as I can see. Wing and tail feathers are in no case so abraded as to leave margin for appreciable differences in measurements due to wear; in fact most of the plumage throughout is fresh. Molt of the body plumage is plainly in progress in all of the specimens, but the primary flight feathers, at least, have all been completely renewed at some not far remote time.

There is, of course, a strong probability that both old adults, more than one year old, and young of the year, are included, the latter in majority. But after some study, I have been unable to tell from any condition of the specimens, which are old and which young. They all look alike. Of course there *might* be some difference in length of bill due to age; on the other hand, since the bill is, in the curlew, of prime importance as a food-getting instrument, it may acquire its full proportions in the individual very promptly, as with the bill of a duck. It seems likely, therefore, that as regards measurements of bill, also, all the specimens (taken in September and October, four to five months old at youngest) are perfectly comparable. Age, then, is a factor which can safely be eliminated.

MEASUREMENTS (IN MILLIMETERS) AND WEIGHTS (IN GRAMS) OF FIFTEEN SPECIMENS OF **NUMENIUS AMERICANUS**, ALL FROM VICINITY OF MORRO, SAN LUIS OBISPO COUNTY, CALIFORNIA

Mus. No.	Sex	Date (1918)	Collector	Wing	Tail	Culmen	Tarsus	Weight
29645	♂	Sept. 21	J. Dixon	256	95.2	124.2	79.0	653.7
29649	♂	Sept. 22	J. Dixon	248	103.3	152.3	89.7	684.8
29650	♂	Sept. 22	J. Dixon	265	108.5	133.1	82.7	745.7
29651	♂	Sept. 28	J. Dixon	264	101.2	136.1	83.1	686.0
29653	♂	Oct. 1	J. Dixon	261	103.3	125.2	80.9	669.1
29654	♂	Oct. 1	J. Dixon	273	106.3	129.7	86.2	791.6
29658	♂	Oct. 6	H. G. White	260	107.6	129.8	81.0	620.0
			Average	261.0	103.6	132.9	83.2	692.9
29644	♀	Sept. 19	J. Dixon	286	106.0	201.7	89.1	838.0
29646	♀	Sept. 21	J. Dixon	275	107.1	159.6	87.8	833.0
29647	♀	Sept. 22	J. Dixon	280	106.4	161.4	87.7	902.0
29648	♀	Sept. 22	J. Dixon	290	108.6	177.6	91.2	873.0
29652	♀	Sept. 29	J. Dixon	291	.....	203.0	93.5	951.1
29655	♀	Oct. 2	J. Dixon	290	106.2	164.8	87.9	630.0
29656	♀	Sept. 19	J. Grinnell	277	107.0	168.2	87.2	768.0
29657	♀	Sept. 25	H. G. White	272	99.6	170.2	85.5	730.0
			Average	280.5	105.4	175.9	88.7	815.6

Another important consideration is that none of the birds was taken on its breeding grounds. Morro Bay is 440 miles from the nearest point (Butte Valley, Siskiyou County, California) at which the Long-billed Curlew is known to have nested. But the species is now extinct there, and probably does not breed nearer to Morro than Malheur Lake, eastern Oregon, 530 miles away. Thence the species breeds to a maximum distance of about 1400 miles to the northeast, in southern Alberta, and to the same distance to the east, in Oklahoma and Texas. The California birds are all migratory, and come from some point in the breeding

range of the species within the limits above indicated. I have no present means of knowing what exact point or what general portion, even, of this breeding range the specimens taken come from, *unless* these birds can be shown definitely to possess subspecific characters as set forth for the two races claimed to be recognizable. This, then, becomes the special object of my enquiry.

In their diagnoses of the supposed two races of *Numenius americanus*, Bishop, Oberholser and Ridgway (places cited above) assign characters as follows:

	<i>americanus</i>	<i>occidentalis</i>
Bishop:	size larger	size "smaller"
(1910)	bill much longer	bill "much shorter"
Oberholser:	size "larger"	size "decidedly smaller"
(1918)	bill "particularly" longer	bill "particularly" shorter
	wing "particularly" longer	wing "particularly" shorter
Ridgway:	size larger	size "smaller"
(1919)	bill longer	bill "especially" shorter

No features of coloration have been ascribed; so that the differentiation of the two forms rests upon "size" (apparently as judged only from chord of closed wing) and, more particularly or especially, upon length of bill. It is obvious, therefore, that carefully ascertained measurements of an adequate number of comparable birds, are essential to determining the meaning of the variation shown in the species.

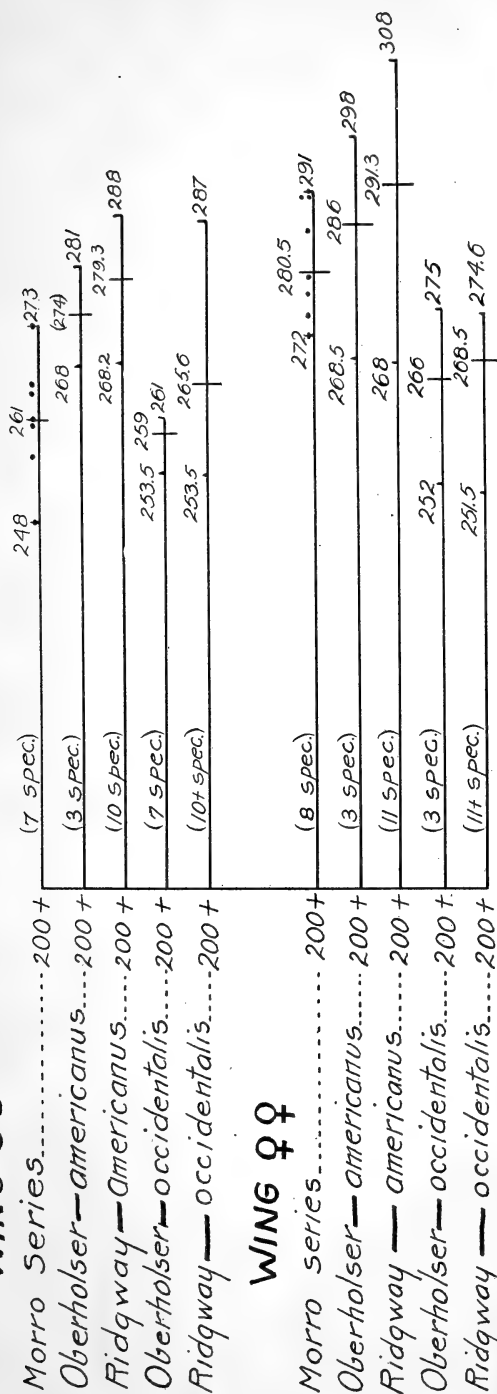
The measurements given by all the authors cited are those of wing, tail, exposed culmen, and tarsus. Bishop gave also length (total) and extent (spread of wings) of the type of "*parvus*" (= *occidentalis*); but these two dimensions are useless in the present study of the case.

Bishop measured a total of 13 males and 10 females representative of the two races he wished to differentiate as well as of intermediates between the two. Analysing Bishop's figures, which he gives in inches and hundredths, we find average and extremes given for 7 males and 3 females of unequivocal "*parvus*" (*occidentalis*) and for just 3 males and 3 females of unequivocal *americanus*.

Turning to Oberholser's review of the problem, the first impression received is that the main object of this writer was to advance a nomenclatural point, namely, to raise the name *occidentalis* of Woodhouse to replace Bishop's *parvus*. There is no question, however, but that he thoroughly endorses the proposed division of the species. Oberholser says: "In this connection we have examined a total of 279 specimens". And yet, to the reader's inescapable astonishment, all of the measurements given by him are merely those of Bishop's sixteen birds "transposed into millimeters"! Not only does the validity of the two races depend upon definitely ascertained measurements, but also does the identification of the individual specimens so depend. Yet the localities for every one of the specimens are given with seeming exactitude under one name or the other. Moreover, the majority of these localities, to judge from the accompanying dates, are for migrants!

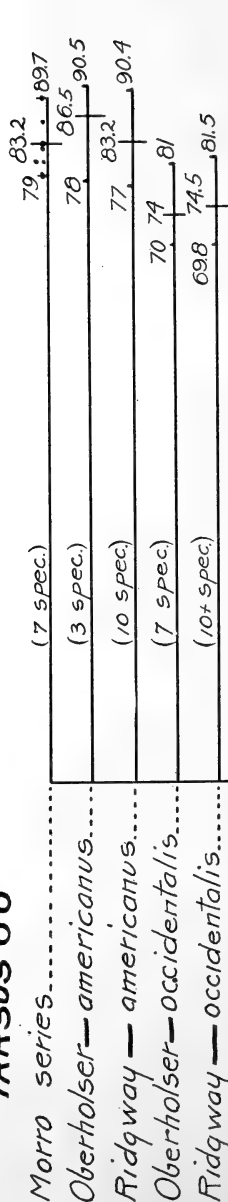
In the interests of accuracy in systematic ornithology I am compelled to point out this extraordinary lapse on the part of the author cited, in not giving original measurements of series of comparable specimens. This lapse vitiates all Oberholser's conclusions in regard to the ranges of the two alleged races, particularly as to the fall, winter and spring when the birds are more or less off their breeding grounds. The reader will recall here the well-known custom of a few systematists (Bishop, at least, included) of diagnosing individual speci-

## WING ♂♂



## WING ♀♀

## TARSUS ♂♂



## TARSUS ♀♀

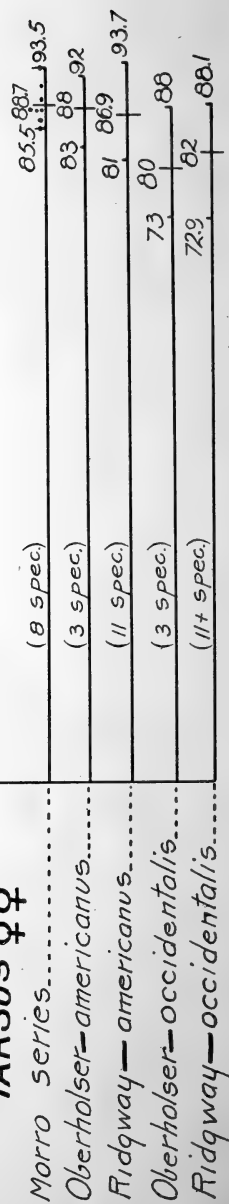
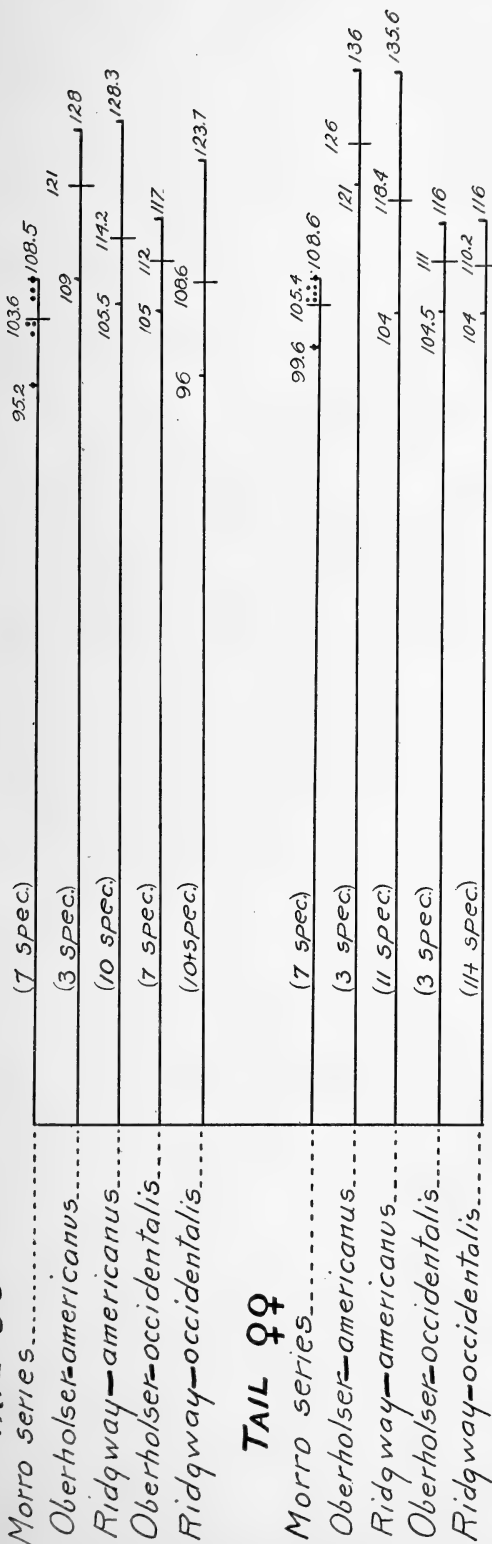
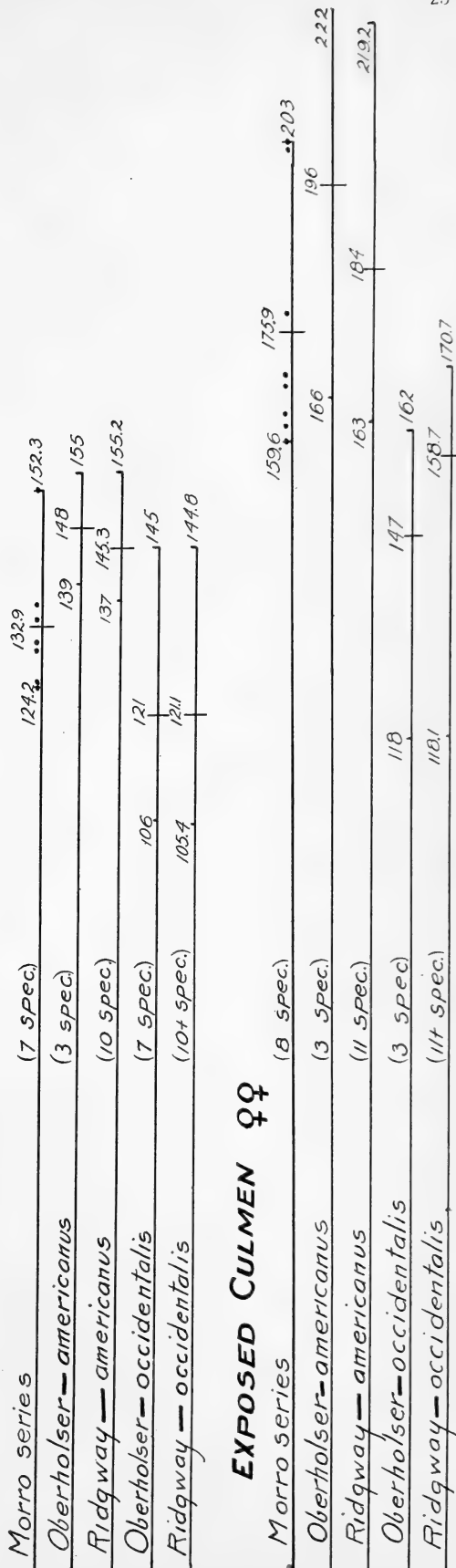


Fig. 5.

# TAIL ♂♂



# EXPPOSED CULMEN ♂♂



# EXPPOSED CULMEN ♀♀

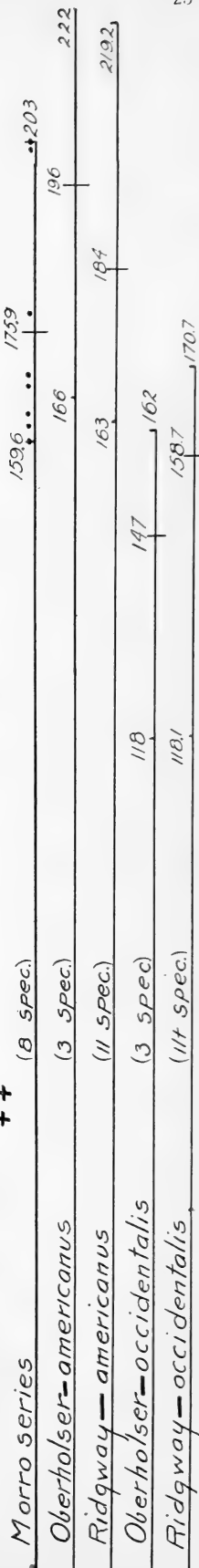


Fig. 6.

mens, where two or more subspecies may be concerned, on the basis of manifest characters irrespective of the probability of immediate blood relationships. In other words, an extreme of individual variation in one subspecies may be diagnosed as belonging to another subspecies. Great danger of coming to wrong conclusions in regard to distribution in general and routes of migration in particular will inevitably result from such interpretation. Far better to leave migrant examples, of equivocal appearance, undetermined as to subspecies. In the case of the Curlews in question the subspecific distinctions claimed are at best only average, and the characters involved pertain to only one or two dimensions. How, then, can Oberholser, or anyone else, say of the majority of individuals taken in migration (when there are no geographic probabilities to regard) which are *americanus* and which are *occidentalis*? And yet Oberholser lists *every specimen* under one head or the other!

As to Ridgway's measurements, he gives his own, of 21 specimens of *americanus* and of a somewhat "larger" number of *occidentalis* (so stated [footnote, p. 394], but not definitely specified because measurement sheets had "been mislaid"). Averages and extremes are presented. It seems quite likely that Ridgway simply followed Oberholser's lead as to the validity of the separation.

I would now call attention to the accompanying graphic exhibition of the measurements of the Morro series in comparison with the measurements of the two alleged races as given by Oberholser and by Ridgway. The dimensions given are of wing, tail, tarsus and exposed culmen; in each case the dimensions are given graphically, natural size, that is, on a scale of 1 to 1. All the measurements of the Morro series were taken by myself. The figures for the graphs were checked back and forth with the kind assistance of Mr. Halsted G. White; and the graphs themselves were drawn and lettered by Mrs. St. E. Abernathy. An enquiry as to the meaning of these graphs (figs. 5 and 6) is in order, and some very curious things come of it.

*As to wing.*—It is to be seen that, while Oberholser's and Ridgway's averages for *americanus* and *occidentalis* do not coincide, the amount of difference involved is close, namely, 6 and 5 percent, respectively, in males and 7 and 9 percent in females. Individual variation is such that overlapping of measurements takes place broadly in all cases except that of Oberholser's males of *americanus* and *occidentalis*, between the nearest extremes of which there is a hiatus of about 6 mm. Ridgway's longest winged *occidentalis* is within one millimeter of being as long as his longest *americanus*.

Referring to the Morro series, it is to be seen that in the males the average falls with *occidentalis*. Yet with the females it falls nearer *americanus*. (Some one may suggest that here is an instance of differential sex migration!) The individuals will be seen to be scattered along pretty evenly, without any obvious tendency to bi-modal grouping.

*As to tail.*—The differences here between the measurements given of *americanus* and *occidentalis* vary from 6 to 14 percent. The amount of overlapping of extremes is very irregular. The Morro series, both males and females, will be seen to fall with *occidentalis*; minima show even lesser figures. As Ridgway has pointed out (tom. cit., p. 391, footnote), there is a likelihood that differences due to method of taking the length of tail are involved.

*As to tarsus.*—The percentages of difference between averages of *americanus* and *occidentalis*, as given by Oberholser and by Ridgway, and for the two sexes, range from 6 percent to as much as 17 percent. Yet there is fully 50 percent



overlap when extremes are considered. The Morro series will be seen to fall into an intermediate position as to males, the average and mode both a little closer to that of *americanus*; while as to females it falls unequivocally with *americanus*.

*As to culmen.*—The shortness of the bill in *occidentalis* as compared with *americanus* is the feature of difference which has been emphasized most. It will be seen that this difference varies from 16 to 33 percent, on the basis of the smaller, according to sex and measurer. The amount of overlapping of extremes is small, even lacking in the case of Oberholser's figures for females (though here, it will be noted, only three individuals of each race were measured). The Morro males average almost exactly between the averages for *americanus* and those for *occidentalis*; the greater number of individuals, however, are grouped below the minima for *americanus* and nearer the average for *occidentalis*. The Morro females are also intermediate, the average a trifle nearer *americanus*, but the mode preponderantly nearer *occidentalis*. Most clearly, there are *not two* modes so that a person could say definitely that part of the individuals fall with *americanus* and part with *occidentalis*.

*Conclusions.*—The effort to identify the fifteen examples of Long-billed Curlew from Morro with one or the other of the two supposed races fails absolutely. There are no color features whatever to go by; and as to average of all measurements the series in question falls into an intermediate position. Yet individual variation is so great that extremes, in one respect or another, of both "*americanus*" and "*occidentalis*" are included. Because of the lack of any grouping of individuals near these extremes it is impossible to allocate the specimens under one head or the other. This fact militates against the hypothesis that both of the supposed races are represented.

Another hypothesis to be considered here is that the Morro birds, being migrants, are from a breeding ground of intermediate geographic position, so that the characters are of intermediate average and the individual variation of wide range and bringing "mosaic" behavior of characters. But the measurements of breeding birds so far published are so very few and the manner in which they are presented so unsatisfactory that nothing conclusive can be inferred on this score.

While the evidence presented by Oberholser and Ridgway points toward a *tendency* of northern bred Long-billed Curlew to be smaller than southern bred birds, the present writer is unconvinced that the amount of this tendency is great enough to warrant recognition in nomenclature. He proposes, therefore, that, at least until a more thorough demonstration to the contrary is forthcoming, the name *Numenius americanus*, without any subspecific divisions, be employed as designation for not only all the Long-billed Curlew of California, but for all those of North America.

The reader is invited to study the accompanying actual-size graphs and see what conclusions he will come to independently.

*Berkeley, California, December 8, 1920.*

NOTES ON SOME SPECIMENS IN THE ORNITHOLOGICAL  
COLLECTION OF THE CALIFORNIA  
ACADEMY OF SCIENCES

By JOSEPH MAILLIARD

**A**MONG the specimens in the research collection of the Department of Ornithology of the California Academy of Sciences are some of especial interest either by reason of their rare occurrence in this state (California), the particular locality in which they were taken, the date of capture, or on account of their exhibiting some unusual characteristics. The recent publication from the University of California Press, entitled "The Game Birds of California", by Messrs. Grinnell, Bryant and Storer—a splendid contribution to California ornithology in its particular line, and most painstakingly up-to-date at the time work was stopped upon it—is the criterion by which the value of many of these records has been determined. Although the existence of much of this record material in the Academy's collection was known to these authors, they did not, at the time they were working upon this book, consider it as being available to them. The following records, then, seem to be of sufficient value to be worthy of note.

**Mergus serrator** Linnaeus. Red-breasted Merganser. While this species is a common winter visitant along the sea coast of California it has been but seldom recorded from the interior of the state. The Academy collection contains one such specimen, a male, taken near Merced, Merced County, California, on January 10, 1878.

**Lophodytes cucullatus** (Linnaeus). Hooded Merganser. This species of merganser was formerly frequently seen in California, occurring as a fall and winter, or even spring, visitant in small numbers on various marshes, small streams, and ponds in many localities, though probably rarely or never in numbers. In recent years it has become scarce and is seldom reported. Its peculiar appearance has led hunters to shoot it on every occasion, which is a way with the gunning fraternity, "just to see what it looks like." Its flesh is also fairly good eating, so that this species is in line for extinction along with many others, unless carefully guarded. There are two specimens in the Academy collection, a male taken near Los Baños, Merced County, January 4, 1909, and a female from Lakeport, March 12, 1908.

**Anas platyrhynchos** Linnaeus. Mallard. The collection contains a fine series of this species, in many plumages, but the only one to be specially noted here is a partially albino female, taken near Los Baños, Merced County, on September 1, 1908.

**Anas**, sp? No. 12581, C. A. S. collection, is a female duck taken near Los Baños, Merced County, California, October 7, 1908, which is labelled *Anas fulvigula*, and so catalogued. The specimen, however, does not entirely conform to the description of that species, although approaching it to a considerable degree. This specimen may be described as follows:

Top of head in color like that of female *platyrhynchos*, but the feathers are rounded and dusky with edges narrowly buffy, the buff making a sort of fine crescent on each feather and creating a scaled appearance, whereas in *platyrhynchos* the feathers of the head are long and narrow with the nearly black centers in strong contrast to the broadly marked buff edgings, giving an appearance of dark, longitudinal streaking, with the buff quite prominent. Malar region buffy and whitish, with narrow dark brown or dusky streak, as in *platyrhynchos*. Throat and chin buffy white, lightest on throat, some of the feathers being buffy with distinctly whitish tips. Lower down on the throat, and corresponding to the position of the white neck ring of the male *platyrhynchos*, is a patch of white, about 15 mm. in width, extending approximately half way around on

each side of the neck, making a kind of semicircle that is somewhat broken by the intrusion of light buffy feathers. Breast a tawny brown, as deep as that of a female *platyrhynchos* in July plumage but with the dusky centers of the feathers much more restricted, paler, and showing much less contrast with the brown edgings.

The abdomen and sides correspond more nearly to those of the Mottled Duck (*Anas fulvigula maculosa*), there being considerable lighter tipping to the already light brown feathers, which all have, however, the blackish brown spot near the tip. This lighter brown, almost white, tipping is not at all regular although all the feathers seem to be of the same molt—that is, they are new feathers—giving the abdomen a slightly mottled appearance other than that caused by the blackish-brown spotting. The back is much like that of the Black Duck (*Anas rubripes*), with a distinctly purplish tinge to the larger feathers of the posterior portion and also to the scapulars. The speculum is *bluish green*, with a white border formed by the narrow white tips of four or five of the greater wing coverts, except for the bluish cast corresponding to that of *fulvigula*. The upper tail coverts are brownish black, with tawny tips, while the under coverts are dusky, with narrow, whitish-buff tipping. The four middle tail feathers are blackish brown and the remainder lighter colored, with pale buff edgings. The lining of the wings is mostly white.

Both bill and feet are so darkened by age and drying that the finer distinctions of color are not sufficiently discernible to be of much value in the determination of this specimen. Its general appearance and markings show it to be closely related to the Mallard (*Anas platyrhynchos*), while its peculiarities connect it with either the Florida Duck (*Anas fulvigula fulvigula*), or the Mottled Duck (*Anas fulvigula maculosa*). The green speculum with whitish border looks very much like that of *fulvigula*, but in the spotting and mottling on the abdomen there seems to be shown resemblance to *maculosa*, although it is possible that this latter characteristic in this specimen may be merely individual and not inherent. It might not show this spotting and mottling in a different state of plumage, or later in the season.

The measurements of this specimen are as follows: Total length (taken in the flesh), 26.0 inches (660.4 millimeters); extent 38.5 in. (976.9 mm.); wing 11 in. (279.4 mm.); tail 4.7 in. (118.6 mm.); exposed culmen 2.15 in. (54.6 mm.); depth of bill at base .88 in. (22.5 mm.); greatest width of upper mandible .92 in. (23.3 mm.); tarsus 2.26 in. (57.6 mm.); middle toe, without claw, 2.26 in. (57.5 mm.).

**Mareca penelope** (Linnaeus). European Widgeon. The Academy collection contains a male of this species taken near Los Baños, Merced County, on December 5, 1903, by R. H. Beck. The European Widgeon has been taken occasionally in this state in years gone by, according to reports, but is becoming more and more rare as time goes on. There are very few California specimens in collections, but there are probably some mounted birds in private hands throughout the country. This bird is commonly mistaken for a cross between the Baldpate and some other species, the Cinnamon Teal being usually the accredited party of the second part.

This specimen in the California Academy of Sciences is in nearly full winter plumage, but still retains a few feathers that are remnants of either the post-nuptial or juvenal plumage. It differs from the description given in Ridgway's Manual of North American Birds, p. 95, as follows: There is a complete circle around the head, including forehead, lores and chin, contiguous to the base of the bill and extending posteriorly for about 15 mm., that is of a pale rusty coloration, spotted with dusky, and distinctly noticeable. Such a marking as this is not mentioned by any authority I have as yet seen, and may be only an individual variation. The measurements of this specimen are: Wing, 263 mm.; tail, 95 mm.; exposed culmen, 32.4 mm.; depth of bill, 18.0 mm.; width of bill, 15.5 mm.; distance from nostril to tip of bill, 24.4 mm.; distance from nostril to lores, 8.9 mm.; tarsus, 36.4 mm.; middle toe, without claw, 38.2 mm.

**Marila marila** (Linnaeus). Scaup Duck. This species is an irregular yet not uncommon winter visitant to California, but it occurs almost altogether along the coast. The Academy collection contains, however, one specimen recorded from the interior, a male taken near Los Baños, Merced County on January 25, 1909, and two others which are rather late seasonal records, having been taken in Alameda County on May 20, 1903.

The measurements (in millimeters) of these three specimens are as follows:

C. A. S. No.		Locality	Date	Wing	Tail	Exposed culmen	Depth upper mandible	Width upper mandible	Tarsus	Middle toe
13178	♂	Merced Co.	Jan. 25, 1909	212.1	59.2	44.9	19.8	25.4	38.6	57.9
11754	♀	Alameda Co.	May 20, 1908	badly worn	58.4	43.2	19.3	25.1	43.2	58.9
11755	♀	Alameda Co.	May 20, 1908	204.5	55.9	40.1	17.8	23.9	38.1	56.4

*Marila collaris* (Donovan). Ring-necked Duck. This is another rather rare species in this state, being seldom recorded nowadays, of which there are several specimens in the Academy collection, two males and six females, all taken near Los Baños, Merced County, in the months of October and November, 1908, and January, 1909.

*Harelda hyemalis* (Linnaeus). Old-squaw. A male in the collection was taken on December 13, 1911, near San Rafael, Marin County, California, a rather unusual place to find this species.

*Grus canadensis* (Linnaeus). Little Brown Crane. While this species seems to be much the more common of the two representatives of this genus in the state, both of which appear to be losing ground though protected by law, there are but few California specimens to be found in collections. Hence the Academy is fortunate in having ten specimens of *canadensis*, all of which were taken in Merced County. Those labelled only "Merced Co." were all taken by R. H. Beck, who had his headquarters at Los Baños in that county, and the presumption is that they were all obtained in that vicinity. On account of the scarcity of available specimens from California the measurements of the ten are given herewith.

C. A. S. No.		Locality	Date	Wing	Exposed culmen	Depth of bill at base	Tarsus	Bare portion tibia	Middle toe with claw
13213	♂	Merced Co.	Mar. 23, 1909	479	94.0	22.1	184.0	72.1	71.1
13211	♂	Merced Co.	Mar. 23, 1909	504	101.6	26.4	218.4	75.2	72.6
13212	♂	Merced Co.	Febr. 18, 1909	495	113.8	27.2	213.4	71.4	66.0
13214	♂	Merced Co.	Febr. 18, 1909	463	95.5	24.9	180.0	69.6	58.4
13661	♂	Merced Co.	Apr. 26, 1909	476	98.2	26.6	196.0	71.6	66.3
13215	♀	Merced Co.	Mar. 23, 1909	475	98.5	23.1	192.0	66.5	61.5
13216	♀	Merced Co.	Feb. 22, 1909	480	92.9	22.4	191.0	65.2	72.6
13217	♀	Merced Co.	Feb. 18, 1909	444	91.2	25.4	186.0	65.4	58.9
22443	♂	Los Baños	Oct. 3, 1897	458	97.8	24.4	194.1	74.2	66.7
22444	♀	Los Baños	Oct. 3, 1897	474	95.4	21.8	212.2	66.5	70.9

There are also three specimens of *canadensis* from Alaska in the collection, none of the measurements of which exceed the above.

*Grus mexicana* (Müller). Sandhill Crane. At the present time this species is rarely met with in California and specimens from this state are also scarce in collections. In fact so scarce are they that the authors of "The Game Birds of California" (Messrs. Grinnell, Bryant and Storer) found only four skins, outside of the Academy of Sciences, for measurements and comparison. Since the date of publication of that work these have been added to the Academy collection, making eight specimens therein

from this state. The measurements of these are given herewith.

C. A. S. No.		Locality	Date	Wing	Exposed culmen	Depth of bill at base	Tarsus	Bare portion tibia	Middle toe with claw
13207	♂	Merced Co.	Feb. 27, 1909	564	138	29.4	254	104	84
13208	♂	Merced Co.	Feb. 27, 1909	550	158	29.2	243	100	89
13209	♂	Merced Co.	Feb. 27, 1909	555	150	32.0	232	.....	87
13210	♂	Merced Co.	Feb. 27, 1909	502	135	28.7	244	95	87
22438	♀	Merced Co.	Jan. 20, 1898	524	153	35.1	240	.....	83
22439	♂	Merced Co.	Jan. 20, 1898	543	140	40.1	231	105	88
22440	♂	Merced Co.	Jan. 20, 1898	545	170	33.6	245	102	90
22441	♂	Merced Co.	Jan. 20, 1898	543	145	33.3	243	110	90

The first four of these were taken by R. H. Beck, while he was stationed at Los Baños, Merced County, and the last four were bought in the flesh in a San Francisco market, the seller stating that they came from near Los Baños. The measurement of the bare portion of the tibia is omitted in two specimens of *mexicana* for the reason that the bone seems to have been pushed up into the skin in each case in such manner as to make the measurement misleading.

In *The Auk*, vol. xxxv, 1918, p. 204, among the proposed changes in the American Ornithologists' Union *Check-List* is that set forth by Dr. L. Brasil (Brasil, *Genera Avium*, xix, 1913, p. 4) to make *Grus mexicana* a subspecies of *G. canadensis*, but no reasons are given in either place cited for this change in status. While we have no large series of these two species in the Academy we are at least fortunate in having in the collection some fifteen specimens of *G. canadensis* and eight of *G. mexicana*, a large enough number from which to make fairly reasonable averages of measurements. Brasil states that in *G. canadensis* the tarsus is always less than 220 mm. and in *G. mexicana* always more than 250 mm., and gives these measurements as the distinction between the two forms; yet, as they do not overlap, no intergradation is shown.

While none of the examples of *canadensis* in the Academy, nor a number in the Museum of Vertebrate Zoology, University of California, reach the 220 mm. maximum of Brasil, several of the *mexicana* come under his minimum of 250 mm. for that species, even going as low as 231 mm. As the matter now stands it seems as if further evidence would be necessary to make a convincing case of such intergradation and few of us will accept the conclusion reached by Brasil until more and clearer evidence is placed before us.

**Steganopus tricolor** Vieillot. Wilson Phalarope. This phalarope is known to breed in favorable localities in northern and northeastern California from the Lake Tahoe region north, and occurs during the spring and fall migrations in other places, mostly inland. It has been casually reported as breeding at Los Baños, Merced County, but has never been actually recorded as doing so. There is, however, a nest in the Academy collection that was taken in the vicinity of Los Baños, Merced County, by R. H. Beck, on June 22, 1908, and contains four eggs with incubation noted as "advanced". The identity given is "♂ shot". While there is nothing on the label denoting that this is the parent of this set, no. 13471, C. A. S., is a male bird taken on that date in that locality, and the only one taken on that day. So it is fair to assume that it is the parent. On the data blank of this set, after a description of the nesting site, are the following words: "3 or 4 pairs probably nesting, tho found no young later on." In 1907 and 1910 Mr. Beck took specimens in June and July at or near Los Baños, so it would seem as if this species bred there regularly.

**Macrorhamphus griseus scolopaceus** (Say). Long-billed Dowitcher. While this species is a common spring and fall migrant through California along the coast and in the valleys west of the Sierras, there are in the collection several specimens from Alameda County, taken between April 4 and May 30, and between July 9 and 20. The former are unusually late spring records and the latter interesting as being taken actually in the summer season.

*Tringa canutus* Linnaeus. Knot. The latest date of occurrence of this comparatively rare migrant during the spring migration in this state that has been recorded is May 10, as given in "The Game Birds of California". There are, however, in the Academy collection a number of specimens of adults of this species taken in Alameda County, supposedly on the San Francisco Bay shore, between May 10 and 24, a male and two females having been taken on the latter date. The plumages of these specimens are in all stages between winter and breeding.

*Pisobia maculata* (Vieillot). Pectoral Sandpiper. There are very few records for California of this species and the two males taken by R. H. Beck near Los Baños, Merced County, on September 15 and 18, 1908, and a female from Point Sur, Monterey County, taken by E. W. Gifford on September 9, 1911, add materially to the meager list of occurrences.

*Ereunetes mauri* Cabanis. Western Sandpiper. This species is an abundant spring and fall migrant along our coast and to a certain extent in the interior as well, wintering from San Francisco Bay southward. The return movement from its northern breeding grounds has been usually recorded as reaching the latitude of San Francisco toward the end of July, but there are many specimens of both sexes in the Academy collection taken as early as July 13 to 15, all adults from Alameda County, and four males from Monterey taken July 16. Incidentally there are numerous juveniles taken in August.

*Totanus flavipes* (Gmelin). Lesser Yellow-legs. The Academy is singularly fortunate in having seven specimens of this bird of California take, as there are but nine other occurrences recorded within the state's borders. Of the seven, one male and one female were taken on September 21, two males and two females on October 6, 1908, near Los Baños, Merced County, and one male on August 19, 1907, on Monterey Bay. As this species can only be distinguished from its close relative, the Greater Yellow-legs, by its smaller size, and as both species are wary and difficult to approach sufficiently close to admit of positive identification, the Lesser Yellow-legs may have occasionally been mistaken for the commoner form. It is probably not as rare a migrant in this state as absence of records would imply, and a systematic and continued search for it in proper localities would in all likelihood develop this fact.

*Numenius americanus* Bechstein. Long-billed Curlew. In "The Game Birds of California" this species is mentioned as occurring in the San Joaquin Valley throughout the year, but is not recorded as breeding there. The Academy collection contains specimens from Merced County, taken in July and August. The above authority also gives it as migrating southward along the California coast in July, and says that these birds "... do not seem to reach inland spots such as the shores of San Francisco Bay until August or September..." This statement is rather contradicted by the presence in the collection of a male taken in Alameda County, July 15, 1910, and two females from the marsh at Alviso, Santa Clara County, taken on July 27, 1909.

*Aegialitis semipalmata* (Bonaparte). Semipalmated Plover. This bird is a very common migrant along the coast of California and there are abundant records. Among the specimens in the Academy collection, however, are several which help to determine the time of arrival in the San Francisco Bay region of the south-bound migrants from their breeding ground in the north. Most of the published records of this species at this period of migration are from southern California, but there are two females in the Academy taken in Alameda County, on July 13, 1909, and several in early August.

*Archibuteo lagopus sancti-johannis* (Gmelin). American Rough-legged Hawk. There is one specimen of this rare visitant to this state in the collection, this being a male taken near Los Baños, Merced County, on December 1, 1908.

Most of the above records were made by R. H. Beck and E. W. Gifford at times when they were occupied in collecting more or less steadily in one spot, and they clearly prove that protracted observations in suitable localities would result in many additions to our geographic and seasonal records for the state of California.

*San Francisco, California, November 27, 1920.*

## FROM FIELD AND STUDY

**Range of the Plain Titmouse in Oregon.**—In the *Auk* (xxxvii, 1920, p. 594) Mr. W. F. Henninger records the Plain Titmouse (*Baeolophus inornatus inornatus*) as a new bird for the state list of Oregon. In looking over the available literature I was surprised to see that this species had not hitherto been mentioned (except in Bailey's *Handbook of Birds of the Western United States*, 1914, p. 456) as a common resident in the south-central part of the state. Its occurrence there has long been known to ornithologists. I have found it common at Grants Pass (November 30), Rogue River (October 4), Gold Hill (March, April and May), Medford (June, 1916), and Ashland (June, 1916). We therefore have a continuous line of records from Grants Pass on the north to within a few miles of the California line on the south. Specimens were taken by the writer at Grants Pass, Rogue River and Gold Hill during the spring of 1916, and I have seen several skins from Medford and Ashland. The species is common in the scrub-oak forests of the region along Rogue River and its tributaries in the lower valleys. So far as known it does not occur in the Douglas fir forests to the east or west of the valley.—STANLEY G. JEWETT, *Portland, Oregon, November 10, 1920.*

**California Woodpecker Steals Eggs of Wood Pewee.**—It is common knowledge that the jay is not the only egg eater among our birds. On occasion birds of many other species rob nests. The worst egg eater yet discovered in my aviary is a Santa Cruz Song Sparrow. The following note adds the California Woodpecker to the list of guilty birds.

While riding horse-back about a mile west of the village in Yosemite Valley, on July 17, 1920, my attention was attracted to a pair of Western Wood Pewees who were snapping their bills and making a great fuss. On looking above my head, I discovered a California Woodpecker (*Melanerpes formicivorus bairdi*) calmly perched on the pewee's nest and eating one of the eggs. I could see the white and the yolk of the egg on the woodpecker's bill, as he raised his head. After watching for some time, I attempted to frighten the robber away, but experienced considerable difficulty in doing so. When he finally left the nest the pewees continued to dart at him, to drive him farther away. Soon one of the pewees, apparently the female, returned to the nest, picked up an egg-shell and flew off with it. I was unable to see what she did with it. In half a minute she returned and began incubating the remaining eggs.—HAROLD C. BRYANT, *Berkeley, California, November 10, 1920.*

**Late Nesting of the Green-backed Goldfinch.**—While working around my place on November 1, last, I was attracted by the notes of a Green-backed Goldfinch (*Astragalinus psaltria hesperophilus*) and upon investigating found two young in a nest, ready to leave. On November 2 the birds had gone and I could not locate them.—W. LEE CHAMBERS, *Eagle Rock, California, December 6, 1920.*

**Speed of Flight of the Red-shafted Flicker.**—In the forenoon of November 1, 1920, I was driving a motor car on the main highway going north out of Fresno. We were making just 30 miles an hour on a level, straight road. The throttle was set and the speedometer was registering the speed very accurately under these conditions. A few miles north of Fresno a Red-shafted Flicker (*Colaptes cafer collaris*), flying from our right, attempted to cross the road about 100 feet in front of us, but upon arriving at the center of the road turned north and flew ahead of us for two-tenths of a mile, keeping about fifteen feet above the road. My guess is that the bird was surprised and, thinking itself pursued, made the best speed it could. We did not change our speed nor did the flicker change its course, and we overtook and passed under the bird in two-tenths of a mile. There was a little wind from the west but not enough to affect the speed of flight. The weather was fair and had been for several days. Evidently the bird was making only 27 miles an hour and flying as fast as it could. While there is no way of proving that the flicker was flying at top speed, the circumstances made me think it was. One of these birds was given a speed of 25 miles an hour when flying parallel with



an automobile but apparently not in front of it (Wetmore, CONDOR, XVIII, 1916, p. 112). These facts are some indication that flickers when not pressed fly very nearly as fast as they do when making their best speed.—CLAUDE GIGNOUX, *Berkeley, California, December 6, 1920.*

**The Bendire Thrasher Nesting in California.**—On April 11, 1920, I was collecting on the Mohave Desert near Victorville, California, with Mr. Selwyn Rich, a fellow member of the Cooper Club. He had the good luck to discover a nest with four eggs, incubation just started, of the Bendire Thrasher (*Toxostoma bendirei*). Unfortunately we were unable to collect the bird, but as the eggs were typical of this species there was little doubt left in our minds as to their correct identity. I substantiated our views, when, on April 26, 1920, in the same general locality, I took a similar set, with the female parent.



Fig. 7. NEST AND EGGS OF THE BENDIRE THRASHER; TAKEN NEAR VICTORVILLE, MOHAVE DESERT, CALIFORNIA; APRIL 26, 1920.

The nest in each case was about four feet up in "cholla" cactus, and in each instance the bird was extremely wary.

The main body of the nest is of sticks, and there is a well shaped cup, lined with fine grasses, weed stems, soft weed bark, a little rabbit fur and some cottony material (see fig. 7).

This adds another to the few records of the Bendire Thrasher in California, and it is, I believe, the first nesting record for the state. The bird collected is no. 1984, coll. W. M. P., and the sets of eggs nos. 1235, and 1266, coll. W. M. P.—WRIGHT M. PIERCE, *Claremont, California, October 4, 1920.*

**Unusual Late Summer Birds in the Yosemite Valley.**—There is a wider dispersal of nesting birds during August and September than at any other time of year. During

these months birds that habitually nest at lower elevations migrate higher into the mountains. Some worth-while evidence in this regard was obtained this summer in the Yosemite Valley, by keeping a daily bird record. Following are a few notes on the "erratic stragglers" that drifted into the Valley during the last few days of July and the months of August and September, 1920.

The first bird of this class to appear was the California Jay (*Aphelocoma californica*). One lone bird was seen on July 26, in the meadow near old Camp Ahwahnee. From this date until September 11, when they were last seen, the birds were found in this locality on every visit. Their numbers increased here, yet they were never seen in any other section of the Valley. On the morning of August 26, ten were counted.

The next wanderer to appear was the Black Phoebe (*Sayornis nigricans*). An individual of this species was first noted July 28. By August 5, there were a number of phoebes scattered along the stream within a mile of the village. One of these appeared one hundred yards above the Sentinel Bridge, selecting a dead stump which stood out of the river as his favorite perch. This bird held down the last patrol; no other phoebe was found up stream beyond this point. During the month of August and the first two weeks in September, phoebes were fairly common along the river below the village. Gradually their numbers decreased and on September 25 the Black Phoebe was noted for the last time.

On August 18, a Western Kingbird (*Tyrannus verticalis*) was discovered in the meadow below the village. When first seen he was perched on a pile of dry sticks. He flew often, diving into the dry grass for grasshoppers. By moving cautiously, the bird was approached to within twelve feet, and identification was made positive. This meadow was visited on several following days, but the bird was not seen again.

On the morning of September 4, in the meadow of our many bird adventures, a solitary White-rumped Shrike (*Lanius ludovicianus excubitorides*) was noted. Two days later the bird was again seen. This time we were able to approach within six feet of it. It was a handsome bird in full plumage and a clear view of its distinct rump patch was obtained.

A pair of English Sparrows (*Passer domesticus*) were noted September 2, in the barnyard at "Kinneyville".

August 29, a flock of fifteen California Bush-tits (*Psaltiriparus minimus californicus*) was seen in the Kellogg oaks on the north side of the Valley. Again, on September 8, a small flock was seen. On September 12, a flock was seen in Illilouette Canyon, three thousand feet above the Valley floor.

On September 28, while we sat eating lunch, a strange bird flew out of the wild coffee bushes and lit in the branches of a Kellogg oak some twenty feet above our heads. We both thought it a waxwing. The actions of the bird were right, but the silhouette was a trifle off—the head did not appear to be crested. The strange bird sat quietly until a flicker flashed by, then, as though frightened, it crouched and sidled along the branch just as waxwings do when crowding together on a limb. In the course of a half hour the bird came three times to the coffee bush. The first two trips it stopped some distance away. As it pulled off berries, with its back towards us, we could plainly see two distinct white streaks, one on either side of the rump. The last time the bird came down from the oak we were able to get within six feet of it, and to identify it as a Bohemian Waxwing (*Bombycilla garrula*). We were greatly surprised to see the Waxwing swallow eight large coffee berries in the few minutes that he stayed in the bush.

Many other interesting birds were seen during our stay in the Valley, some that passed through in early spring on their way to the higher country, and birds that were driven down into the Valley during storms.—CHARLES W. MICHAEL and ENID MICHAEL, Yosemite, California, March 10, 1920.

**The Harlequin Duck in the Yosemite Valley.**—On arriving in Yosemite, on June 1, I was informed by Mr. and Mrs. Charles Michael that a pair of Harlequin Ducks (*Histrionicus histrionicus*) had been seen along the Merced River, near the Sentinel Hotel, on May 11 and May 26. On June 4, Mrs. Amy M. Bryant watched a pair of Harlequins for some time as they swam about in the river, and as they preened their feathers while perched on an old log. The birds were observed by other visitors in the Valley on several different occasions.

During July the birds were apparently absent, until July 21, when a female was discovered feeding in a gravelly riffle about one-fourth mile east of the Sentinel Bridge. The water was only three to four inches deep and the current strong. The bird seemed to be industriously turning over the rocks to obtain food between and beneath them. Often she was wholly immersed for from six to ten seconds by count. At the end of about ten minutes she drifted down the river and dove several times in still water. In the afternoon about 5:45, this female Harlequin returned to the same feeding ground and was watched again. For a full half-hour it continued feeding in the same manner, continually ducking its head under the swift current and always working up-stream.

Apparently the Harlequin does not procure all of its food by diving, but at times feeds in shallow water. The occurrence of these birds during the nesting season and the disappearance of the male during the middle of the summer would indicate nesting of the species in the Valley or close at hand, but no direct evidence in this regard was secured.—HAROLD C. BRYANT, *Berkeley, California, November 10, 1920.*

**Distribution of the Townsend Fox Sparrow.**—In studying Swarth's *Revision of the Avian Genus Passerella* (Univ. Calif. Publ. Zool., vol. 21, 1920, pp. 75-224), the attention of the writer was drawn to some apparently erroneous conclusions of the author regarding the migration and distribution of *Passerella iliaca townsendi*, particularly as to its winter range.

On page 145 of the paper under discussion, Swarth states "The Townsend fox sparrow is a notable example of a bird with a winter habitat nearly as sharply defined as its summer home." On page 105 he states further that "*townsendi* in turn leap-frogs over *fuliginosa*", the breeding bird of the Puget Sound and Vancouver Island region, the impression being given here and by the map on the following page that the "sharply defined" winter habitat of *townsendi* lies entirely south of that of *fuliginosa*. The author further, on pages 145-146, calls the attention of the reader to the apparently discontinuous distribution of *townsendi* in the southern part of the Alexander Archipelago. The 1909 Alexander Expedition failed to find it at the localities visited in that region, but Swarth (loc. cit.) mentions the fact that it is known to be a common summer visitant to Forrester Island, near the southern extremity of the archipelago, and records summer specimens taken by other collectors at Howkan and Wrangell.

The following data from notes of the writer accumulated during six summers (1914-15-16-17-19-20), and one winter (1919-20), spent in the region under discussion, fill some of the gaps noted by Swarth and modify some of the conclusions which he reached. The greater part of the six summers were spent on Forrester Island, but occasional short visits were made at this season of the year to nearby points on Dall and Prince of Wales islands. During the winter of 1919-20 the writer resided at Craig, Prince of Wales Island, but frequent trips were made to nearby sections, to Suemez, Dall and Long islands, and to other points on Prince of Wales Island.

That the Townsend Fox Sparrow breeds more plentifully on Forrester Island than at any other point in the southern end of the Alexander Archipelago is very true. But that it fails to breed on Prince of Wales, Dall and Long islands, the writer doubts. Although the 1909 Alexander Expedition failed to find it in the region in summer, the writer has found it at that season at Craig and Waterfall, Prince of Wales Island, at several points on Dall Island, and at Howkan, Long Island, and, though no occupied nests were examined at these points, several nests entirely typical of the bird were noted in the fall.

On Forrester Island the species was always present at the time of the writer's arrival, the earliest date being April 21 (1915). In this locality probably fifty nests were examined during six summers. The majority of the eggs are laid between May 20 and June 20, extreme nesting dates being April 29 (1915), a nest with one fresh egg, and July 9 (1916), a nest with three eggs.

During the latter part of August there is apparently a movement up the sides of the mountains, and for some time after this date *townsendi* is quite rare near sea-level. This movement is shared to a considerable extent by the Varied Thrush (*Ixoreus naevius naevius*) and Oregon Junco (*Junco oreganus oreganus*), the three species being frequently found in close proximity in the woods on the mountain sides from about 1000 feet altitude to timber line. As the weather becomes cooler they work back down the mountains to the shore. At Craig, in 1919, the Townsend Sparrow became common in

woods along the beaches by October 9, and remained so throughout the following winter. In fact, in this locality it proved to be a much more common bird in winter than in summer. Numerous specimens were taken during the winter months but few toward spring, as at this latter season they become so fat as to be difficult of preparation.

The fact that this bird winters commonly at the southern end of the Alexander Archipelago must necessarily modify Swarth's definition of its winter habitat in Oregon and northern California.—GEORGE WILLETT, *Wrangell, Alaska, November 1, 1920.*

**The Nuptial Flight of the Allen Hummingbird.**—The description of the nuptial flight of the Anna Hummingbird (Hunt, CONDOR, XXII, p. 109) has prompted me to offer an account of the mating antics of the Allen Hummingbird.

On the afternoon of April 16, 1920, I was walking through the hills back of the Claremont Club golf links when I was brought to a halt by a rather prolonged buzzing sound, very penetrating and metallic in quality, somewhat similar to the sound produced by drawing a fine-grained file over the edge of a piece of sheet steel with a sudden jerk. Looking in the direction of the sound I saw poised in the air about twenty-five feet from the ground, a male Allen Hummingbird (*Selasphorus alleni*), uttering his commonly heard mouse-like squeaks. Then followed the performance of the nuptial flight, similar to that of the Anna Hummingbird, though the path described in the air was somewhat different. He "rocked" back and forth over the female, which was perched on a twig of a low poison oak (*Rhus diversiloba*), describing a semi-circle about twenty-five feet in diameter. There was a pause at each end of the arc, and before the pause he spread his tail and shook his whole body so violently that I wondered how his feathers remained fast. During this time he continued uttering the characteristic squeaks. After several of these semi-circles were described he began his climb to a height of about seventy-five feet; and then came the "high dive". He swooped down with the speed of a comet, and on passing over the female gave the low-pitched but resonant buzzing sound which had first attracted my attention; then he curved upward and came to a pause about twenty-five feet in the air, where I had first seen him. The sound emitted on passing over the female was of a second or more in duration, and differed greatly from the instantaneous, metallic *clink* of the Anna Hummingbird.

Following the accompanying diagram in which X represents the female, he started at A, describing the arc AB with the violent shaking just before arriving at B. After a short pause at B (one or two seconds) he returned to C, repeating the shaking just before arriving, and again pausing. This much of the performance he usually repeated one or more times, thus describing several semi-circles from A to B and from B to C. The last time from C, instead of pausing he continued upward with a slow, heavy flight, describing spirals or undulations until he reached the top at D, when, without pause, he made the downward swoop, sometimes bringing up at E to recommence the whole performance, and at other times darting off to perch a few yards distant for awhile and then return.

Mr. Hunt states (loc. cit.) that he does not know whether the Anna Hummingbird adheres rigidly to the evolutions described or whether it varies them. I had the good fortune on the morning of March 15, 1920, at Washington Park, Alameda, to witness the nuptial flight of this bird and it was slightly different from his description. My bird, in making the long dive from *c* to *d* (fig. 27, loc. cit.) made a sudden jump of about six feet to the left at a point about opposite *a*, and then continued his downward swoop to *d*. Otherwise this performance was identical with that described by Mr. Hunt.—FRANK N. BASSETT, *Alameda, California, September 2, 1920.*

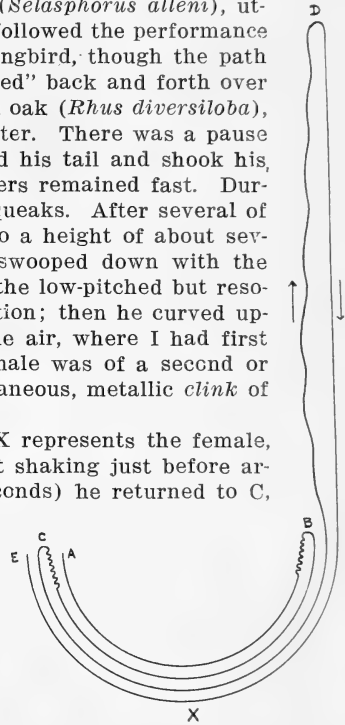


Fig. 8. DIAGRAM ILLUSTRATING THE NUPTIAL FLIGHT OF THE MALE ALLEN HUMMINGBIRD.

**A Unique Visitor.**—On the tenth day of October, nineteen hundred and twenty, at one o'clock in the afternoon, after two days of intermittent showers—some heavy, some light—a beautiful young gull landed on the woodpile in back of our cottage, which is

situated in a lonely canyon about thirty-two miles east of the Pacific. He appeared very hungry and tired, alternately feeding and resting. He violently shook and ate the head of a rabbit discarded by our collie; he mangled a hornet attracted by the rabbit, but suddenly decided not to devour it; he snapped at passing insects; he thrust his bill with such force into a cluster of white geraniums that the petals flew in fragments to the ground; he stalked under the fig trees, with his pale lavender-gray webbed feet, and tossed the figs about, though he did not seem to relish them especially. He circled the collie, who had been nonchalantly watching him, and would have alighted on her back if she had not flicked her ear. He appeared absolutely fearless, often walking within touching distance of our hands, and occasionally resting close beside us, partially shutting his eyes, and fluffing out his breast in drowsy content.

One hour he stayed with us, and in that hour I had ample opportunity to examine him minutely and identify him as a young Sabine Gull (*Xema sabini*). This identification was later corroborated by Dr. Grinnell, who added that the bird was "evidently in full juvenal plumage—a bird hatched last June". Then he lifted his beautiful wings and flew away, flew low, over the mesas and the sage-grown hillsides, flew toward the east in a faltering manner, as though he fain would return. Did our beautiful bird, Pearlcito (for so we named him), safely voyage over the chaparral?—MELICENT HUMASON LEE, *El Cajon, California, November 29, 1920.*

## EDITORIAL NOTES AND NEWS

New Year's morning, Mrs. Amelia S. Allen, Secretary of the Northern Division of the Cooper Club, gave a reception to the Club at her home on Mosswood Road, Berkeley. The occasion was a pleasant one socially, and in addition there was an ornithological feature of remarkable interest. The bird feeding table just outside the large plate window of the dining room where breakfast was served to the human guests was continually patronized by numerous avian visitors. These latter represented some ten or more species—thrashers, thrushes, wren-tits, towhees, etc.—all wild birds, behaving normally. The differential lighting on the two sides of the window, darker within than without, doubtless in part accounted for the charming obliviousness of the birds. Within, the considerable company of people was able to observe the birds closely under most comfortable conditions, even to comment upon them freely in ordinary conversational pitch of voice, without alarming or distracting the principals in the nature play being acted outside.

Mr. Aretas A. Saunders, author of *Avifauna No. 14* (Birds of Montana), now in press, has called our attention to an error in the postcard pre-notice of this publication sent out recently by our Business Manager. Mr. Saunders was for five years with the United States Forestry Service, and during two summers worked at the Biological Station of the University of Montana; but at no time has he been connected with the United States Biological Survey, as was stated.

Mr. and Mrs. Vernon Bailey are in camp for the winter in the foothills of the Santa Rita Mountains, Arizona (post office, Continental, Pima County). Their camp mascot is a Roadrunner who "comes regularly for spare mice".

We learn from Dr. T. S. Palmer that the meeting of the American Ornithologists' Union in Washington, D. C., November 8-11, 1920, was one of the largest in the history of the Union. One-half of the Fellows and about ten percent of the entire membership were in attendance. The business meetings were held at the Cosmos Club and the other sessions at the U. S. National Museum. The election of Fellows and Members included Mr. Robert Cushman Murphy of Brooklyn, N. Y., as Fellow; Mr. E. C. Stuart Baker and Dr. Percy Lowe of London, Honorary Fellows; and Mr. Ira N. Gabrielson, Dr. Loye Miller, Mr. Aretas A. Saunders, Prof. T. C. Stephens, and Prof. Myron H. Swenk, as Members in the restricted sense. The program of nearly 40 papers, five of which were illustrated by motion pictures, covered a wide range of subjects relating to North American birds and also included papers on the birds of Argentina, Nicaragua, Peru, Europe and Madagascar. In connection with the meeting an exhibition of drawings, paintings, and photographs of birds by American artists, supplemented by a series of prints showing the development of zoological illustration as applied to birds from the earliest times down to date, was arranged in the Division of Prints in the Library of Congress.

Dr. H. C. Bryant, Economic Ornithologist, California Museum of Vertebrate Zoology, and also in charge of Education, Publicity and Research, California Fish and Game Commission, left early in January in company with Dr. Loye Miller, Associate Professor of Biology, Southern Branch, University of California, to attend the State Parks Conference, at Des Moines, Iowa. After the Des Moines conference, a series of lectures were to be given by these naturalists in eastern cities to stimulate interest in a nature guide service for all the national parks. During the past summer, they organized the Nature Guide work in the Yosemite Valley, and at some of the Lake Tahoe resorts. This included trips afield and lectures, and was an attempt to satisfy the yearning of the summer vacationist for nature lore. Nature guiding in the Yosemite National Park proved so popular that there is likelihood that it will be made a permanent feature not only of the Yosemite but also of other national parks throughout the United States.

Mr. Allan Brooks is located at Jupiter, Florida, for the winter. He is occupying himself while there in making colored drawings of various waterfowl, particularly ducks, these to be used in illustration of books which are in preparation by certain eastern ornithologists. Mr. Brooks attended the A. O. U. congress in November, and for a time was the guest of Mr. L. A. Fuertes, at Ithaca, New York. Indeed, the two went to Florida together, the last-named for but a short stay. Later, Dr. L. C. Sanford joined Mr. Brooks. Mr. Brooks plans to return to his home in British Columbia late in April.

#### MINUTES OF COOPER CLUB MEETINGS

##### SOUTHERN DIVISION

OCTOBER.—Regular monthly meeting of the Cooper Ornithological Club, Southern Division, was held at the Museum of History, Science and Art, at 8:00 P. M., October 28. Members attending were: Mesdames Fargo, Martin, Terry, and Warmer; Miss Miller; Messrs. Dickey, Hornung, Howard, Howell, Miller, Pierce, Robertson, Van Rossem, Warmer, and Wyman. Mrs. Howard, Mrs. Schneider, and Mr. Langdon were visitors.

Minutes of the September meeting were read and approved. On motion of Mr. Robertson the Secretary was instructed to cast an electing ballot for persons whose names were presented at that meeting. New presentations were: Harry Milton Wegeforth, M. D., 210 Maple St., San Diego, by W. DeW. Scott; John E. Overholtzer, 6 West Main St., Morristown, Pa., by R. J. Middleton; Nathaniel A. Francis, 35 Davis Ave., Brookline, Mass., by W. Lee Chambers; Elbert Benjamin, 109 Coral St., Los Angeles, by Mary

Mann Miller; Mrs. John McB. Robertson, Buena Park, Calif., by John McB. Robertson; J. Thomas Fraser, Jr., 432 W. Hawthorne St., Eureka, by Lawrence Zerlang; Emmet Joy, San Andreas, by Ethel Crum; George C. Shupree, Box 964, San Antonio, Texas, by Antonio H. McLellan; Charles Springer, Cimarron, N. Mex., by J. Stokely Ligon; Webster H. Ransom, 708 West 20th Ave., Spokane, Wash., by Stanley Jewett; Miss Evelyn Kennedy, 232 W. Ave. 52, Los Angeles, by Roland C. Ross; Miss Elizabeth Burnell, 419 So. Olive St., Los Angeles, by L. E. Wyman; Regina Woodruff, Zool. Dept., Univ. Calif., by Dr. Olive Swezy; Clelia A. Paroni, 2430 Bancroft Way, Berkeley, by Dr. H. C. Bryant; John Thomas Waterhouse, Honolulu, T. H., by Annie M. Alexander; John Forbes Rickard, 250 Tunnel Road, Berkeley, and Mary I. Compton, 6510 1st Ave. N. E., Seattle, Wash., by Anna Head.

Routine business finished, Dr. L. H. Miller read a paper on the rearing of a pair of house finches which had come into his possession just after hatching. His account of their development and behavior was highly instructive as well as entertaining. The usual informal discussion and inspection of a series of hawk skins completed the session. Adjourned.—L. E. WYMAN, *Secretary*.

NOVEMBER.—Regular monthly meeting of the Cooper Ornithological Club, Southern Division, was held at the Museum of History, Science and Art, November 23, at 8:00 P. M. In the absence of both President and Vice President, Mr. Dickey was acclaimed Chairman of the evening. Members present: Messrs. Appleton, Bishop, Brouse, Brown, Chambers, Colburn, Dawson, Dickey, Edwards, Esterly, Hanaford, Howell, Hornung, King, Little, Pierce, Reis, Rittenhouse, Ross, Robertson, Suits, Taylor, Van Rossem, Wall, Wyman; Misses Atsatt, Burnell, Davidson, Kennedy and Pratt. Mesdames Bishop, Brown, Chapman and Dawson were visitors.

Minutes of the October meeting were read and approved, followed by reading of the minutes of the Northern Division for October. Applicants whose names were presented at the previous meeting were declared elected, on motion of Mr. Chambers that the Secretary be instructed to cast an electing vote. New presentations were: Hattie E. Shepherd, R. 1, Box 73, Redlands, and A. R. Shepherd, 457 Burchett St., Glendale, California, proposed by Frank N. Bassett; Roy W. Quillin, 1025 Summit Ave., San Antonio, Texas, proposed by O. P. Silliman. Elections of the Northern Division were approved.



An invitation from the Bird Lovers' Club to hold the January meeting jointly with them was voted upon favorably, but the Secretary was instructed to request that the date be deferred until February. Mr. Robertson moved that the Chairman be authorized to appoint a nominating committee of three; seconded by Van Rossem; carried. The appointees were Messrs. Brown, Van Rossem and Howell. Business Manager Chambers made the announcement that *Avifauna* No. 14, "The Birds of Montana", is nearly ready for mailing.

Serious business completed, Mr. Howell gave an interesting account of a 5000-mile automobile trip extending over a period of five months, in which he followed the line of spring from Los Angeles to Montana, returning via the western coast of Washington and Oregon. Followed an hour of general discussion and inspection of a series of hawk skins.

Adjourned.—L. E. WYMAN, *Secretary*.

#### NORTHERN DIVISION

OCTOBER.—The Northern Division of the Cooper Ornithological Club and the Northern California Section of the American Society of Mammalogists held a joint meeting in the Map Room of the University Library, October 28 at 7:30 P. M. The larger works on birds and mammals contained in the University Library were on exhibition and the evening was spent in looking over these books. At 9:30 P. M. a short business session of the Cooper Club was held, at which Mr. Wright presided. The following members were present: Mesdames Alexander, Allen, Florence Merriam Bailey, Blake, Bridges, Ferguson, E. Ferguson, Flynn, Grinnell, Kellogg, Kibbe, Law, Pringle, Roe, Thomson, and Wythe; Messrs. Vernon Bailey, Bell, Cooper, Dixon, Elmore, Evermann, Grinnell, Hunt, Kibbe, Law, McLean, Storer, Swarth, Wheeler and Wright. Visitors were Miss Ruth Dodge, F. E. and M. N. Garlough, Gillilan, Lamonioux, Mr. Blake, Mr. Bridges, and Mr. Steilberg.

The minutes of the September meeting were read and approved and were followed by the reading of the minutes of the September meeting of the Southern Division. Mrs. Georgianna T. Roe and Francis G. Gilchrist were elected to membership and elections by the Southern Division in September were approved. New names proposed were Dr. R. L. Rigdon, 1617 Broderick St., San Francisco, by Cornelia C. Pringle; Perry R. F. Marshall, 1495 W. Adams St., Los An-

geles, by J. Grinnell; J. W. McKibben, 2522 Piedmont Ave., Berkeley, by J. S. Cooper; and John William Stacey, 634 Powell St., San Francisco, by F. N. Bassett.

Adjourned.—AMELIA S. ALLEN, *Secretary*.

NOVEMBER.—The Northern Division of the Cooper Ornithological Club met at the Museum of Vertebrate Zoology, November 18, at 8 P. M. Pres. Wright presided, and those in attendance were: Mesdames Allen, Ayers, Bridges, Flynn, Hohfeld, Kibbe, Law, Meade, Newhall, Thomson, and Wythe; Messrs. Carriger, Cooper, Dixon, Gignoux, Gilchrist, Grinnell, Lastreto, Mailliard, McLean, Noack, Silliman, Storer, Swarth, White, and Wright. Visitors: Mr. and Mrs. Arnold, Mr. Bridges, Mrs. Caldwell, Mr. and Mrs. Clark, Miss Devendorf, Mrs. Heilman, Mrs. Hyde, Mrs. Noack, Prof. Price, and Miss Wythe. Minutes of the October meeting were read and approved, followed by reading of the October minutes of the Southern Division. Mr. Perry R. F. Marshall, Dr. R. L. Rigdon, Mr. J. W. McKibben, and Mr. John W. Stacey were elected members of the Club. Elections by the Southern Division in October were approved.

New names proposed were: Mrs. Charles Gilman Hyde, 2579 Buena Vista Way, Berkeley, by Mrs. Edwin B. Mead; Mr. George B. Culver, Stanford University, by Prof. J. O. Snyder; Mr. and Mrs. Lewis Arnold, 2732 Benvenue Ave., Berkeley, by Mrs. Edwin Blake; and Mrs. Lydia Wilcox, 10 Latona St., San Francisco, by Mrs. Eva D. Roe. Mr. Storer reported for the committee appointed to investigate the eagle situation in Alaska.

Business completed, the program as announced for the evening was presented. Mrs. Allen gave a summary of bird bands placed during 1918, 1919, and 1920, the main item being the return of three winter visitants to the same feeding table where they spent the previous winter. Dr. Grinnell explained the meaning of adventitious coloration and described the case of a pair of Plain Titmouses in plumage colored yellow, probably by the spores of a fungus which lined the cavity occupied by them. Mr. Law took up in detail the probable origin of the three groups of subspecies of the Fox Sparrow as described by Mr. Swarth in his recent monograph. In his reviews of recent literature, Mr. Swarth gave critical estimates of articles by L. R. Dice, R. C. McGregor, Bangs and Kennard, and F. M. Chapman. A number of interesting seasonal observations were presented, after which the meeting was adjourned.—AMELIA S. ALLEN, *Secretary*.



**For Sale, Exchange and Want Column.**—Any Cooper Club member is entitled to one advertising notice in each issue free. Notices of over ten lines will be charged for at the rate of ten cents per line. For this department, address W. LEE CHAMBERS, *Eagle Rock, Los Angeles County, California.*

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**HAROLD H. BAILEY** of Newport News, Virginia wishes to announce that he has moved his Museum and Library of Natural History to Miami Beach, Florida, where he expects to establish at an early date "The Florida Museum of Natural History". Mr. Bailey has also started work on a book on the Birds of Florida, and any notes on Florida birds will be appreciated by him. Address all correspondence and specimens in the future to **HAROLD H. BAILEY, Route One, Miami Beach, Miami, Fla.**

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**Northern Division:** 8 P. M., fourth Thursday of month, at Museum of Vertebrate Zoology, University of California, Berkeley. Take any train or car to University Campus. The Museum is the corrugated iron building on south side of campus just north of football bleachers.—**MRS. AMELIA S. ALLEN, Sec'y, 37 Mosswood Road, Berkeley, Calif.**

**Southern Division:** 8 P. M., last Thursday of month, at Museum of History, Science, and Art, Exposition Park, Los Angeles. Take car marked "University", west-bound on 5th Street (in down-town district); get off at 39th Street and Vermont Avenue. One long block east to Park. The Museum is the building with the large dome.—**L. E. WYMAN, Sec'y, care of Museum.**

**Intermountain Chapter:** Get date and place from the Sec'y, **ASHBY D. BOYLE, 351 5th Ave., Salt Lake City, Utah.**

**San Bernardino Chapter:** Get date and place from the Sec'y, **M. FRENCH GILMAN, Banning, Calif.**

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The building of a journal begins with the mechanical preparation of the copy by the author. This work may be so managed that it will later contribute toward accuracy of workmanship, dispatch in handling, and economy of production. Coöperation of author with editor, publisher and printer results in benefit to all four. The author secures creditable presentation of his ideas, the editor is relieved of needless drudgery, the publisher obtains the highest quality and best service for the amount expended, and the printer profits by the economy of time, effort and materials.

As regards the author, an important feature of his coöperation is to see that his *manuscript is as nearly as possible ready for delivery to the printer.*

*The Condor* is published by the Cooper Ornithological Club, and practically all the Club's money goes into the magazine. Articles published in *The Condor* are written by Club members. Poor copy for the printer results in poor proof, requiring repeated resetting of type and rereading of proof. *Resetting type costs money.* Money saved by good management in this regard may be expended toward a larger and better magazine. As an aid toward such economy the following rules and recommendations have been drawn up.

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1. Manuscripts, if not typewritten, should be in *perfectly clear handwriting.*
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3. In typewritten manuscript *always leave double space* between the lines. In handwritten copy leave as much space as is occupied by the written line itself.
4. Liberal margins should be left at the top and sides of the sheets; at least  $1\frac{1}{4}$  inches at the left side.
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Observe *Condor* style and usage, familiarize yourself with its leading features and prepare your paper accordingly. "General articles" and the brief "Field and Study" items are printed in different styles.

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Respectfully submitted,

THE EDITORS OF THE CONDOR.

# THE **C**ONDOR

A Magazine of Western  
Ornithology



Volume XXIII

March-April, 1921

Number 2



COOPER ORNITHOLOGICAL CLUB

# THE CONDOR

A Magazine of Western Ornithology  
Published Bi-Monthly by the Cooper Ornithological Club

Entered as second-class matter November 29, 1919, at the post-office at Berkeley, California, under Act of Congress of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized January 5, 1921.  
Issued from the Office of THE CONDOR, Museum of Vertebrate Zoology, Berkeley, California

## SUBSCRIPTION RATES

Two Dollars per Year in the United States, payable in advance.

Forty Cents the single copy.

Two Dollars and Twenty-five Cents per Year in all other countries in the International Postal Union.

## COOPER CLUB DUES

Two Dollars per year for members residing in the United States.

Two Dollars and Twenty-five Cents in all other countries.

Manuscripts for publication, and Books and Papers for Review, should be sent to the Editor, J. GRINNELL, Museum of Vertebrate Zoology, University of California, Berkeley, California.

Claims for missing or imperfect numbers should be made of the Business Manager, as addressed below, within thirty days of date of issue.

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Issued March 31, 1921

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# THE CONDOR

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## THE BIOGRAPHY OF NIP AND TUCK

A STUDY OF INSTINCTS IN BIRDS

By LOYE MILLER

A MEASURE of unwelcome clouded the arrival at my office of Nip and Tuck, a cloud, to be sure, not realized by those unheavenly twins, yet none the less distinctly a cloud. Nor did they realize anything within or without beyond the supreme crisis of their unlimited hunger. For that matter, how much farther does the appreciation of any three day infant extend? Naked, blind, and helpless little linnets they were, thrown upon the care of a human foster parent by some agency that had destroyed their natural habitation and its builders. A paper carton from the delicatessen counter, a mattress and a coverlet of cotton batting, a pair of dissecting forceps, a medicine dropper, and a willing but not over sanguine human male constituted the equipment to which they fell heir. It was not a fair substitute for the natural abode and the tireless parents which had been theirs for the three days of their existence outside the shell. Nor was it a fair chance that they had for survival, yet it was a fighting chance and the brief story of that fight with some of the things they taught their foster parent (we learn much from our children) is offered you for what it may be worth.

The foster parent whom necessity forced upon these naked "cell aggregates" (that's all they were) happened to be a biologist and an educator with, very naturally, the conviction that education is the supreme refinement of biology—a treatment of the highest function of the highest animal. Somewhere during his biological communings he had gotten the impression that linnets are strictly vegetarian in diet and that the young are fed by regurgitation of partially digested food from the parent crop. Something had to be done rather promptly to simulate the natural food of the starving waifs if their lives were to continue. Where should one more naturally turn than to the department of Domestic Science? That department was in charge of a mother, so the appeal of helpless infancy met with an instant and a hearty response. Whole wheat bread constituted the initial step in the building up of the artificial schedule of dietetics. Why? Because the cooking had brought about therein a series of chemical changes comparable, in a measure, to those fermentative changes worked upon weed seeds within the parent's crop. What next? The lining of the crop in some birds secretes a chemically perfect milk containing butter fat, cheese, and milk sugar. Probably young linnets receive some such product mixed with their fare of cracked and partially di-

gested seeds pumped from the parent's crop into their yawning mouths. The probability seemed strong enough, at any rate, to warrant the trial of dairy milk as the fluid medium and, behold, a time-honored baby food was the result, bread and milk. Quite a long and laborious process of reasoning to arrive at so simple a prescription as bread and milk, you may think. Yes, but you know one of the great values of scientific education is that it offers a good excuse for continuing to do some of the things we have done for generations anyway—if they happen to please us.

The interesting part of the whole matter was the final and wholly satisfactory influence upon the twins. Let me remind you in the words of that homely philosopher of the day's fiction, Mr. Dooley, "Af ut worrks uts roight." What better test could be asked for an experiment than that it succeed? Here was a scientific theory and a homely, common sense practice operative to a perfectly satisfactory result. The biologist and educator, who believed in the synonymy of his two titles, was delighted. More to the point, the twins were, too.

From that time on until their comparative independence in food gathering, Nip and Tuck thrived upon bread and milk, corn flakes and milk, shredded wheat and milk, or some equally grano-lactose combination. "So are we kin to all that is."

To the parent of mere human offspring who has labored days (and nights), months and years to navigate the customary shoal waters of croup, measles, whooping cough, etc., the almost explosive suddenness with which the successive growth stages in birds appear is little short of startling. After the first day of readjustment to a new regime the twins were carefully weighed each morning at the same hour on delicate chemist's balances. Results for the first twenty-four hours had to be checked over repeatedly before the unassailable facts could be credited: The twins had gained 24.3 per cent in weight since the previous day at the same hour! Is it surprising, then, that feathers seemed almost to pop from their skins to cover an infant nakedness? What wonder that each morning seemed to show a change in appearance since the night before? Much of that stuffing of bread crumb and milk had been transformed by the alchemy of biology, into baby bird instead of into the human deity which is so commonly the product of that homely ambrosia. What wonder that young birds are little else than digestive apparatus surrounded by a relatively thin wall of potentialities? They need all that laboratory of digestion. Digestion and assimilation are their chief business and they attend to that business pretty strictly. As is usually the case, attending to business produced good results and within fifteen days Nip and Tuck had changed from speckled, pale blue eggs to feathered birds able to fly up hill.

Of course the biography of every infant must take cognizance of his dawn-ing mentality as evidenced through the oracle of the first spoken word. What vast interpretations are placed thereon! How profoundly interested everyone else is supposed to be! Long tedious months must elapse before even his mother can claim for the child that he has indulged in articulate speech. During that time unlimited volumes of baby talk have been poured in upon the plastic matrix of his brain cells without tangible result. Ultimately, however, our words come back to us with growing distinctness, though regrettably they too often bear those mutilations of the mother tongue which have been poured into his ears as "baby talk" and which later have to be unlearned. Of whatsoever nationality, caste, or hereditary strain the infant may be, the speech of



the nurse becomes the first tongue of the child. Is it so with birds? Do the little ones learn by their mother's twitterings?

The early speech of Nip and Tuck was a matter of great concern, therefore, to their foster parent. At the time of their adoption into human society their vocal expression was limited to a subdued squeak inaudible at a distance greater than a yard. What possibilities were there for training such voices and fashioning them to an ideal set by the teacher? Educators are wont to stick their fingers into the plastic clay of childhood merely to see how perfectly their thumb prints may be impressed. Why not try out a theory on the twins? Do the offspring acquire a vocabulary by imitation or do they inherit it through the generations? Parent linnets, during visits to the nestling young, utter a very definite note of constant character. If another note were substituted and were sufficiently frequent in its repetition, would that sound be acquired by the young? Since the twins were obliged to accompany their new parent to and fro on a ten mile trip daily, there was every reason to believe that the dominant musical influence of their impressionable period would be the song of a Ford engine. However, with the commendable optimism of the educator who believes that a small leaven of uplift will raise the sodden mass of grosser influence, the foster parent set to work to administer that uplift.

The linnet's feeding note was carefully avoided and, in its place there was given the sharp, ringing note of the Canyon Wren, and on this auditory diet the little birds' receptive centers were fed during the period of infancy. Would they first lisp in the language of linnet or that of the Canyon Wren? Would the chromosome of inheritance yield to the stimulus of environment? Not so, as we shall see. With the growing strength of the young birds, the squeak increased in volume up to a limited maximum. Then on a certain morning Nip awoke from his after-breakfast nap and burst forth with an entirely new note, not a mere squeak, but a truly vocal sound, the perfect call of the young linnet. Despite his artificial upbringing, Nip had discovered himself a true linnet and spake in the tongue of his ancestors. Tuck soon followed in the way of the more progressive Nip and the infantile squeak was no more heard. Nip and Tuck had refused "baby talk". Again the cheerful educator pocketed his failure and consoled himself that he had gained by his loss—through his failure had a new truth been established.

Perhaps such a result should have been expected from an attempt to modify those more fundamental notes we might designate the call notes, but what of the more superficial, the more complex and variable character, song? Voice quality in birds is largely, it would seem, a matter of structure of the vocal chords and hence is conveyed by the bearers of heredity as definitely as are the characters of beak or claw. Song, however, may be modified as to its sequence of notes, and some highly imitative birds of varied vocal power have been taught a variety of performances.

Not discouraged by the seeming failure of the first attempt at uplift, the uplifter therefore continued his effort at vocal education throughout the growth period of his charges, in the hope of influencing the song of the male. Was it disappointment or was it secret satisfaction over a substantiated theory that held first place in the biologist's mind when, six weeks later, just before the necessary interruption of the intimate association of pupil and teacher, Nip burst into his first song? It was a song he had never heard before and had never rehearsed, the tribal song of his fathers.



That there are instinctive responses on the part of animals to certain qualities in sound is a matter of common experience. The distress quality in bird notes is difficult to define and may sometimes be wholly imaginary, yet it is many times the stimulus of an instinctive response. Individuals representing many varieties of birds will, in a state of nature, come hurrying through the woods, each one giving its own call, to the spot where a bird of an alien race is uttering its note of distress. It was interesting in this connection to observe the response of these young linnets to the distress call of chicks, a sound entirely foreign to their individual and, doubtless, to their racial experience. The little birds were kept upon the lecture room desk where their frequent meals could be administered by student or by instructor with a minimum of disturbance. One morning, while the twins were serenely quiet beneath their cotton blanket, a discussion of the quality of bird sounds brought about the illustration of a certain point by an imitation of the chick's distress call. Immediately the cotton blanket was heaved up and two excited young linnets tumbled about in the nest in response to the stimulus of a sound they had never before heard. The incident means much to us when we consider the many times we have seen the distress calls of excited bird parents rouse the nest full of young to efforts at flight. We so often say that the mother is teaching her young to fly when, in reality, all she is doing is to apply unconsciously a stimulus. An Anglo-Saxon reared pack mule when treated to a series of expletives in Mexican-Spanish, gets the same psychic message from his driver as though he were an accomplished linguist. So Nip responded to the complaint of a lost chick by rising up on his wobbly legs and uttering the call note of his race.

I am obliged to confess to an undercurrent of guilty feeling within me when I recognize in my own offspring a perfectly orderly sequence of events as they develop the grasping reflex, the suckling reflex, or later on, the self assertion and the play instincts, a chain of natural traits that follows the law of a million ancestors. It seems a bit underhanded, especially in the presence of that other and happily less analytic partner in the infant's ancestry, even to admit the possibility that ours is not the first child who has performed such a wonderful and so perfectly adorable a trick. However, no such sense of treachery marred my pleasure in watching the twins' orderly progress. That progress was so rapid that it seemed like twenty years of human experience concentrated into a twenty days resumé. Sometimes there even arose a half formed wish that human young might be still more biologic than they are. Take the bathing instinct as an illustration. One day the very masculine Nip, without coaxing of any zealous parent but wholly from some inward urge, took a bath and made an impressionistic toilet. Oh, that our own young might feel that heaven-born inspiration toward clean hands and a smooth part!

Really though, the trouble is not with our children but with our own impatient selves. If we were willing to wait fourteen long years for that tornado of new instincts at adolescence, we would find that even the human male would think of his personal appearance and would voluntarily wash at least the front part of his face and polish the toes of his boots. Nip waited six weeks for the inspiration toward cleanliness, but it came all in good time. Let me not be understood as favoring fourteen years of unwashedness for boys. No indeed. We must live with them and some of us actually enjoy the living, artificial as life may seem to the boy. But isn't it interesting to note how four-

teen years of ineffectual training (or of nagging) will slough off like an old pupa skin and the urge finally come from within?

Another great source of friction between the generations, and a thorn of tribulation for both, is table manners. Would the twins learn to eat properly? How the educator did labor with his adopted offspring only to find that his efforts went for nought. For three weeks they were fed with medicine dropper and tweezers. The subjects performed most dutifully. They came to the finger at "mess call", opened their mouths, and gulped their portions in proper bird fashion. Then, all at once, Nip refused this infantile treatment and would not open his beak. He was not the victim of green apples nor of eating between meals, for, when the food dropped from the tweezers, Nip picked it up and made his meal man fashion. The time had come to put away childish things and they were put away. He was never again fed by hand. Now, although she was born at the same time as Nip, little Miss Tuck was always a goodly bit behind him in development of her instincts. Despite the splendid example of the precocious Nip and the labored efforts of the foster parent, who felt that his most tedious task should be at an end, Tuck refused to pick up her food. The table would be set before the two and Nip would plunge in with boy-like exuberance, bent solely upon the engulfing process. Tuck would see the food and recognize it, would open her mouth and beg, seemingly entreating it to come and satisfy her craving. The tweezers would pick up morsels and dangle them before her and she would follow the movement with open mouth, but never, unless the lining of the beak was touched, would she seem to get the proper stimulus for taking food. For five days this ineffectual effort at education continued, then the proper instinct ripened as it had in Nip, and Tuck picked up her own food. The ripening, however, was incomplete and for three weeks at the beginning of each meal she continued to beg to be fed.

I wonder why we parents of human young are so intolerant of the petty bickerings that arise between children—children, too, who are really fond of each other. A distracted mother or even the less intimately associated but short-memoried father, may wonder where, in their long line of respectable ancestors, those children picked up so much quarrelsomeness. We worry about such things. On the other hand, how cunning are little puppies, or above all things, little bear cubs! They tussle and growl and chew at each other as they roll and scuffle in the straw. We laugh at them. Is not the cub quarrel due to the natural development of individuality, the birth of the ego? At any rate it seems to come in the natural course of events in cubs, human or otherwise. The tendency should be recognized even though society demand that it be curbed. Nip and Tuck, being normal infants, developed the quarrel instinct at the proper time in their history. There was nothing to quarrel over, there was plenty of perch room and plenty of food—yes, and plenty of plebeian "human nature", or animal nature, taking its natural course. All at once the combative instinct appeared and they quarreled over nothing. As Uncle Remus would say, "Dey quarr'l 'an quarr'l' jes like folks." Here was good evidence that Nip and Tuck were developing normally and the foster parent rejoiced in that normality. The quarrels didn't last long and they were so fascinatingly human.

Again the fond and sometimes censurable parent takes pride in the lack of self-consciousness of its offspring. The child is taught all manner of "cute tricks" which it performs that the older folk may be politely amused. Final-

ly comes a day when the child is afraid, it hides its face and screams or else it retires behind the mask of a child's immobile stare. Often he is punished for being naughty, wilful, or silly while the chagrined and disappointed parent may make more of a fuss and disturbance over the matter than does the child itself. The visitor, according to his lights, feels sorry for the one or for the other. Nip and Tuck, brought up by hand, were on very intimate terms with their foster parent. They performed most cleverly for visitors, coming to the finger to be fed, allowing themselves to be warmed in the enclosing hand, or to be transferred from cage to table freely. There was no consciousness of self or of the parent. But one morning the instinct of fear had come. Like a migratory warbler flying at night, all at once it was there, and Nip was afraid of me. He would not come to call, he would not tolerate approach. He saw this great creature through different eyes, the eyes of self-consciousness, and he was afraid. He had never been mistreated but he never entirely lost again his attitude of reserve. You may be sure he was not punished for wilfulness or for silliness, the child's common cloak for inward fear.

But, like most fond parents, I lose perspective and prolong the story of my infant prodigies. The biologist has proven his point. Learning to feed properly is but the development of an instinct as are the learning to bathe and to preen the feathers. Like learning to sing, to quarrel, to fear, even to fly, they are not learning processes at all. They are but stages of growth. That magnificent series of reflexes involved in flight is not the result of experience. The first time the birds attempted to fly they flew, not far, but well. They could not fly far because they lacked strength. They flew well because of an inborn coordination of sensory and motor nerves, a sort of racial knowledge conveyed by heredity to the fertile egg from which each had sprung. All these tricks and traits developed in orderly fashion as the time for each arrived. In this development Nip was always just ahead of Tuck, but the order of appearance was the same in both. Yes, the biologist had proven his point; but did he leave anything for the poor educator?

The educator can learn much from the story of Nip and Tuck. One lesson is that much of our so-called education is but a superficial patting of the human clay, a holding of child activity to certain orthodox lines pending arrival of the inward urge upon which we may work. Can we truly say that education ever creates the impulse? Rather does it liberate impulse. The twins did learn many things, some of which were temporary expedients to serve through the formative period. We need a few such in education. Finally, is it not the function of education to take the native worth and make it more worthy? Nip's instinct of fear, tempered by education, became a proper reserve toward clumsy humans, however well meaning. Birds' inherited voices respond to later training after their adult structure has been attained, and they may come to execute a variety of songs.

The aim of education, then, is not an uprooting of the natural attribute but is a sort of top working effect for the improvement of that native root-stock. Education should be constructive, not destructive.

Rodin enscribed one of his celebrated marbles with these words: "I feel two natures struggling within me." The phrase well depicts the unstable attitude of mind of this particular foster parent in regard to his experiments on the heavenly twins. Did he fail in one attempt, there is consolation for the biologist in saying "I told you so." Did he succeed in another, there was the

pleasure of the optimistic educator who sees training lay hold upon and glorify the inherent tendency. Altogether, remembering that he claims to be both biologist and educator, he derives much pleasure from the entire experience, which same constitutes a commendable philosophy. Try it, patient reader who may have followed to this point the lengthened but truthful biography of Nip and Tuck.

*Los Angeles, California, December 9, 1920.*

## NOTES ON TWO CHARACTERISTIC BIRDS OF THE SAN GABRIEL WASH

By ROBERT S. WOODS

WITH FOUR PHOTOS

ON THE STONY, brush-covered lands along the San Gabriel River at Azusa, Los Angeles County, California, the bird usually most in evidence is the Cactus Wren (*Heleodytes brunneicapillus couesi*), by reason of its active, noisy ways and the abundance of its bulky, flask-shaped nests in various



Fig. 9. ADULT CACTUS WREN PERCHED ON "LEAF" OF PRICKLY PEAR CACTUS; SAN GABRIEL WASH, NEAR AZUSA, CALIFORNIA; MARCH, 1916.

stages of decay. The majority of the nests, which are constructed of dead weeds and grass and lined with feathers, are placed in the taller clumps of prickly pear, probably on account of the small size of most of the cholla cae-

tus. The birds evidently have full confidence in the inaccessibility of their nesting sites, as the nests are located in the most conspicuous positions and the birds do not hesitate to approach them while under observation. The nests, including those of the previous season, are used as sleeping quarters throughout the year. The birds retire early, and if one walks among the cactus after sunset the end of a tail may be seen in the entrance of each habitable nest.

A feature typical of the adult Cactus Wrens in this locality is the large black throat patch, beginning abruptly below the whitish chin and breaking up on the chest into streaks and spots. The young do not acquire this marking for some months after attaining full growth, the throat and chest being lightly and uniformly speckled with black. The young wrens are even more noisy

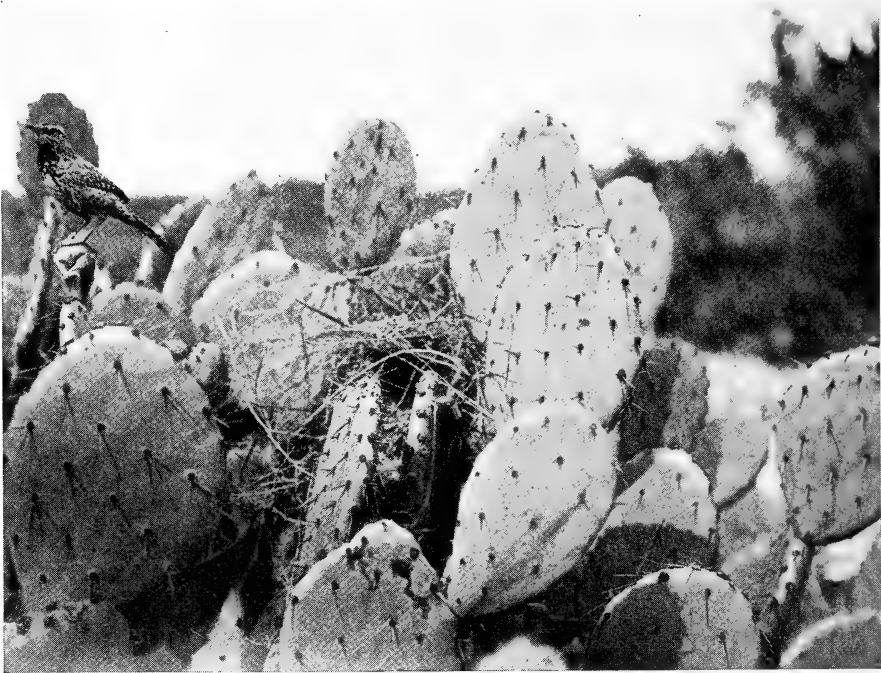


Fig. 10. CACTUS WREN AND NEST IN PRICKLY PEAR CACTUS; SAN GABRIEL WASH., NEAR AZUSA, CALIFORNIA; MARCH, 1915.

and curious in their disposition than the adults, climbing over any unusual object, such as a camera, and investigating it thoroughly. The Cactus Wren has three rather strident calls which it uses almost constantly except while on the ground; but in this particular locality it seldom if ever sings at any season of the year. The food, which includes ants, is mainly obtained by searching through dead vegetation on the ground, raising leaves and small stones with the beak and peering under.

While the area of brush-land suited to the habits of the Cactus Wrens is not likely to be reduced rapidly, they take kindly to civilization, frequenting the house roofs, and this year a pair even building a nest on a lookout under the gable of a ranch building. They show a marked fondness for sweet corn when the husk has been opened so as to expose the ear, but have not been observed to molest any other vegetable or fruit.

The Costa Hummingbird (*Calypte costae*) shown herewith, has returned to the same location at Azusa for the last three years at least, arriving the latter part of March and leaving early in June. The presence of the Costa Hummingbird may be recognized by its prolonged shrill whistling note, usually uttered while swooping through the air, but sometimes also while at rest. It has no song such as that of the Anna Hummingbird.

The Costa Hummingbird feeds from both wild and cultivated flowers and from orange blossoms. This occupies little of its time, most of which is spent on certain favorite perches from which a comprehensive view may be obtained.



Fig. 11. ADULT MALE COSTA HUMMINGBIRD;  
SAN GABRIEL WASH, NEAR AZUSA, CALIFORNIA; APRIL, 1920.



Fig. 12. ANOTHER POSE OF BIRD  
SHOWN IN FIGURE 11.

It shows no special hostility to birds of other sorts, though occasionally diving at them from high in the air, to which maneuver, however, the other birds generally pay no particular attention. The female usually stays inside the bushes, where it is often seen hovering among the leaves as if seeking food.

Considerable variation is noticed in the color of the gorget of the same individual male, this sometimes appearing bluish violet and at other times magenta. The nest has not been found, as the movements of the birds I watched gave no clue to its location.

*Los Angeles, California, September 28, 1920.*

## THE PRIBILOF SANDPIPER

By G. DALLAS HANNA

WITH ONE PHOTO

THE DATA upon which this study is based have been secured during seven years of acquaintance with the species. Valuable information on nesting habits has been furnished by Messrs. C. E. Crompton and P. C. Partch, formerly of St. George Island.

The Pribilof Sandpiper (*Arquatella ptilocnemis*) is chiefly of interest because of the fact that it has an exceedingly limited breeding range and probably the shortest migration route of any northern shore bird. It is known to breed only upon St. George, St. Paul, St. Matthew and St. Lawrence islands, all located in Bering Sea within an area not over 400 miles in greatest dimension. The winter range of the species is practically unknown, the only records being from Portage Bay, southeast Alaska (Hartlaub, *Journ. für Ornith.*, 1883, p. 280), and Lynn Canal (Ridgway, *Birds of N. and Mid. Am.*, VIII, 1919, p. 246), between Alaska and British Columbia. The appearance of the birds at the former locality in flocks in spring (if identifications were correct) indicates that they wintered farther south, probably on Vancouver and other islands of British Columbia. They could hardly have come from beyond these localities and have remained undiscovered. The species has been reported in fall migration about Unimak Pass, Alaska (McGregor, *Condor*, VIII, 1906, p. 119), and in spring on the Bristol Bay coast (cf. Palmer, *The Avifauna of the Pribilof Islands, in Fur Seals and Fur-Seal Islands of the North Pacific Ocean*, III, 1899, p. 403, and Osgood, *N. Am. Fauna*, no. 24, 1904, p. 62).

If the specimens taken by McGregor (*ibid.*, p. 119) on Unimak Island on August 14 (printed August 4 in Ridgway, *Birds of N. and Mid. Am.*, VIII, 1919, p. 247), and on Tigalda Island, August 5, were correctly identified it is possible that the species breeds there and was not migrating. No indication of migration has been noted so early as that on the Pribilofs, although a few early breeders may have left. In 1920 I made persistent and thorough search for the species about Unalaska, September 7 to 18, and at Woody Island, September 21 to 23, but with only negative results.

There is apparently but one record of the bird breeding on St. Lawrence Island. Nelson (*Rep. Nat. Hist. Coll. Alaska, 1877-1881*, Wash. 1887, p. 105) found a single pair on the south shore in June, 1881. Elliott (*Monog. Pribylov Group, U. S. Dept. Int.*, 1881, p. 129, footnote) had previously stated distinctly that he did not find it there.

In 1916 I found it on St. Matthew Island (*Auk*, XXXIV, 1917, p. 409) just as abundantly as Elliott (*ibid.*) had described. It is, if anything, a more common bird there than on the Pribilof Islands; and furthermore it breeds on the lowlands, in many cases just back of the drift wood lines, while farther southward it resorts to the uplands. Fresh eggs and downy young were found on St. Matthew in early July and this would indicate that the nesting season was somewhat later there than on the Pribilofs.

I strongly suspect that the birds have some other extensive breeding ground than St. George, St. Paul and St. Matthew islands, because in September and October large flocks come to the two former islands; these appear to



contain many more individuals than are in existence on all three. Whether St. Lawrence Island supplies the extra number or not remains for future determination.

Spring migration takes place the latter part of April and the first half of May. My earliest record for St. Paul Island is April 15 (1915) when a flock appeared at Northeast Point. The height of migration is a little later than that date and may usually be expected from the first to the fifteenth of May. Birds are almost invariably paired upon arrival. Very few spring flocks have been seen on the Pribilofs, and they do not tarry by the beaches but go directly to the upland nesting sites. It seems to be uncommon for more than the resident population to land upon an island in spring. The birds seem to go directly to the chosen breeding grounds wherever they may be. This fact is of wide application among the northern shore birds. Only rare stragglers of such species as golden plovers, turnstones, and Pectoral and Sharp-tailed sandpipers stop at the Pribilofs on their way north, but large numbers of some of them come in fall.



Fig. 13. AN AVERAGE SET OF EGGS OF THE PRIBILOF SANDPIPER. SLIGHTLY LESS THAN NATURAL SIZE.

On St. George Island the high upland tundra has been chosen for breeding ground. Here, among the reindeer "mosses" and light gray, lichen covered rocks the sandpipers reign supreme in the fog. Some speculating may be indulged in to find a reason for so unusual a choice of locality. Elevations up to 500 feet are sought. Perhaps they shun the sea coasts on account of the presence there of large numbers of foxes. During all history this has been a greater fox island than either St. Paul or St. Matthew. On the latter island in June and July the birds may be found in large numbers around and back of the drift wood piles. If it were not for this fact being known we might suspect that on St. George the light gray tundra was selected for protective purposes, the birds themselves being distinguished chiefly by their light colors.

St. Paul Island for some unaccountable reason is not chosen as a breeding

ground except by a very few pairs. In 1919 not over a dozen were found during the entire nesting season, when almost all of the available areas were seen. The country about Northwest Point is the chief site, but birds have been found near the coast on low land by Polovina seal rookery and on Telegraph Hill. There are large tracts of apparently suitable tundra which are left unoccupied. I know of but one set of eggs having been taken on that island (and it was by a native), so the scarcity cannot be attributed to the industry of egg hunters. Birds are even more abundant on St. Paul in fall than on St. George and but few of them are shot for food at either place.

If a person climbs to the sandpiper country on St. George during May or June, one of his first surprises will be a series of notes very much like those of the flicker, a full deep whistle repeated in the same pitch about a dozen times in quick succession. The bird utters this while on the wing, most likely when it is coming toward the intruder with great speed. When close by it wheels and settles lightly on a nearby hummock or "niggerhead". One wing will be held vertically extended for a few seconds after alighting and may be flashed at short intervals thereafter. Another note for which I have no descriptive language always reminded me of the sound of tree frogs. It is the note usually given when the birds are on the ground. While neither can be called a song, they are very attractive and pleasant to the listener and most surprising to one familiar only with the "peep peep" of sandpipers in winter.

The elevating of one wing is an action for which no logical reason can be given. It is indulged in by both male and female and at times when it cannot be considered a signal. Nor can it be taken as a warning to intruders because it is often seen when one's presence is to them unknown. It is not seen after the breeding season is over and is no more explicable than the comparable "fiddling" of our familiar crabs. Palmer (*ibid.*, p. 401) noticed that the near wing was elevated first and might be followed by the other, but this does not seem to be the rule except when the bird is manifestly endeavoring to attract attention. For instance when one is lying concealed and the birds are following their own inclinations either wing may be elevated first.

On the breeding grounds of St. George and St. Matthew the birds are very common, and from one to a dozen are in almost constant attendance upon the visitor. They sight him from afar and fly to meet him. Some bird will almost always try to lead him astray. If followed, it flies from knoll to knoll, often not more than twenty yards away. It remains in front of the visitor regardless of the direction he may take; whether toward or from the nest, makes no difference. After several minutes of this a sudden flight, with the familiar "song", is taken to some distant hill and the searcher for a nest is left confused and confounded.

A search for the nest will exhaust the patience of any except the most persistent collector. Messrs. Crompton and Partch have been more successful than any one else in locating them and all of us agree that when a bird flies to meet the visitor, as just described, it is a pure waste of time to watch or follow it. Every method known to us of locating nests by watching the actions of the parents has failed. We have located nests and then endeavored to establish rules for guidance with others, but no definite facts could be determined. It was finally agreed that it was useless to watch a bird under any circumstances more than fifteen minutes. If the location of the nest is not disclosed in that time it is safe to assume that the mate is on it and it might be

hours before the guard would go there. In the meantime it may fly half a mile away and forget to come back, even to tease the hopeful collector lying concealed in the mist and fog behind some cheerless rock. No definite range can be ascribed to any one pair of birds because those off the nests mingle indiscriminately. Very often a bird will fly completely out of the range of vision in the fog.

The best plan to follow in the search for nests seemed to be to just walk and hunt, and several factors combine to make the task difficult and discouraging. In the first place the incessant fog and mist settle on the lenses of those obliged to wear spectacles and vision is clouded very quickly; the same thing prevents the use of field glasses to any but a very limited extent. The nesting sites are from two to eight miles from the habitations and the intervening country is very rough and difficult to traverse. Moreover, "hiking" is not always enjoyed when one must be encumbered with hip boots, oil-skin and sou'wester, the only means of keeping dry.

Sometimes a bird will leave the nest when one is ten or even fifteen feet away, but usually it must be almost stepped on before it will fly. Being the same color as the tundra it is almost invisible until it moves. Partch located a nest with three eggs in 1920 and carefully marked it by placing two piles of moss in range with the nest. Upon returning later we were unable to locate it although we knew within ten feet the exact position. We decided to give it up, but later in the day when we were passing close by we decided to take another look. This time the bird was flushed when we were several feet away and there we saw our tracks from the earlier search not twelve inches from the nest.

The action of a bird leaving a nest is unmistakable and can always be recognized, once it is learned. It is a quick, excited, jerky flight, very close to the ground, and the bird goes but a very few yards until it feigns injury in its endeavor to entice the intruder away. It will always flutter in front of a person, even though he walk directly toward the nest.

When the bird is seen to fly the eggs are even more inconspicuous and difficult to find unless the exact spot from which it flew be located. Crompton thus flushed a bird which he knew had a nest, but he was at a loss to find it. At last he left his cane as nearly as possible where the nest should have been and repaired to a nearby rock to watch and wait. In a few minutes the bird returned to the eggs, which were located about a yard from the stick. When a bird is flushed from a nest it seldom happens that the other parent is near.

The nest is a mere depression about three and a half inches wide by two and a half inches deep. Most of the material is removed, but it is evidently packed down to a certain extent. No foreign material is carried at all. The nest is usually, but not necessarily, on some very slightly elevated ground and among the lichens called "reindeer moss". Some nests have been found where there was an admixture of *Hypnum* moss and again where the dwarf willows creep, root-like, beneath the surface.

The normal set of eggs consists of four. A greater number has never been found and a less number only when it was uncertain if the full set had been laid. As much as three days may intervene between egg laying, but usually the four are deposited on successive days. When one set of eggs is taken another will be laid. But the same nest is not used the second time, the conten-

tions of some natives to the contrary notwithstanding. A set of eggs found as late as July 24, 1917, certainly indicated that two may be laid in the same season on rare occasions. One set is the rule.

The color of the eggs is, as would be expected, somewhat variable. The lightest set examined in connection with this report has the ground color greenish glaucous (Ridgway, Color Standards and Color Nomenclature, 1912). From this there is perfect gradation through court gray and light olive gray to deep olive buff in the darkest set. Variation in any particular set is very slight. Spots are large and bold as a rule. They vary in size from 15 millimeters to less than one and they are usually massed about the larger end. In one case the eggs are uniformly spotted with small spots all over. In none is the spotting heaviest on the smaller end (reversed eggs). Spots are usually inclined to be round but occasionally they are in the form of streaks arranged roughly in spiral form. Only rarely are they banded about the larger end. In two cases a narrow black line was produced spirally on the larger end. The coloration of the spots varies from snuff brown to sepia and from cinnamon brown to mummy brown. In some cases they are raw umber. The darkest shades occur where the spots overlap and some deep-seated ones are pale aniline lilac or pale to deep quaker drab. Only rarely is the outline of a spot not sharp.

The description by Coues (in Rep. upon the Condition of Affairs in Alaska, by Henry W. Elliott, 1875, p. 186) of the first set of eggs collected has been copied many times and represents an average nest. The measurements of the four eggs as given by Palmer (*ibid.*, p. 404) are: (converted to millimeters) 39.2x27.3, 38.5x26.6, 37.9x27.3, 37.4x26.6.

The following table gives the measurements of 18 fine sets. They have been taken very carefully with vernier calipers and show more variation than would perhaps be suspected.

MEASUREMENTS OF EGGS OF PRIBILOF SANDPIPER

ALL TAKEN BY G. DALLAS HANNA

Orig. No.	Length	Breadth	Orig. No.	Length	Breadth
1028	39.9	28.4	1849	39.6	27.9
	42.0	28.3		40.4	27.5
	41.2	27.8		40.5	27.7
	41.0	28.2		39.2	28.0
1208	40.9	27.5	1850	41.5	28.6
	39.5	27.0		41.3	26.8
	41.7	27.5		38.4	28.1
	39.0	27.4		40.1	28.4
.....	37.9	28.5	1851	38.9	26.9
	39.7	28.2		38.8	27.1
	40.0	28.6		37.4	27.0
	39.1	27.9		38.8	27.0
1843	38.9	26.8	1852	39.1	26.4
	41.8	26.4		40.6	27.3
	37.9	27.3		40.8	27.0
	40.3	26.9		38.5	28.4
1844	39.0	27.8	1853	38.2	27.4
	39.8	27.3		39.5	27.1
	39.9	26.5		39.2	27.5
	40.1	27.0		38.8	27.3

1845	39.3	27.1	1854	40.6	27.9
	40.3	27.5		40.8	27.7
	41.4	27.4		39.6	27.4
	40.0	26.9		40.8	27.5
1846	39.9	27.0	1855	38.6	27.0
	38.7	26.8		37.6	27.3
	39.0	27.9		35.0	27.4
	40.1	27.8		39.1	27.3
1847	39.0	27.5	1885	39.8	26.8
	38.6	27.3		37.7	26.8
	38.3	27.6		37.5	26.9
	36.5	27.0		38.7	27.5
1848	37.6	29.0	2104	41.2	27.0
	37.7	28.6		40.9	26.9
	38.5	28.6		42.0	26.8
	38.1	28.4		40.0	26.4

The average dimensions derived from the above series of 72 eggs are: Length, 39.473 and breadth, 27.468. Those which showed the extreme measurements were 42.0 by 27.8; 35.0 by 27.4; 37.6 by 29.0; and 39.1 by 26.4.

Through the courtesy of Mr. Chase Littlejohn I am permitted to make comparisons of the eggs of the Pribilof Sandpiper with a set of four eggs of the Aleutian Sandpiper he collected on Sanak Island, Alaska, in 1882. One egg of this set is precisely like the average set of Pribilof eggs illustrated in fig. 13. Coloration, method of spotting, size, and shape are the same. The other three eggs are quite different. They lack the olive or greenish tinge to the background and the spots are not massed about the larger end. They tend, however, to form an irregular zone about the greater diameter. There is also a greater profusion of small spots mixed with the larger than in Pribilof eggs. Mr. Littlejohn states that the considerable series of eggs collected by him conformed to the coloration and pattern of these three, and that the single dark egg of this set is the only one he ever saw. The average measurements of the four eggs are 39.0 by 27.2 and of the three which are considered typical of the species, 38.7 by 27.0.

The measurements of the eggs of the Aleutian Sandpiper have been given by Oates (Cat. Birds' Eggs Brit. Mus., II, 1902, p. 57) as varying from 38.2 to 35.4 in length and from 25.3 to 24.0 in breadth (measurements converted to millimeters). The figure which he gives (*ibid.*, pl. II, fig. 10) does not conform to his description of coloration, and the spots contain considerably more reddish than those of the eggs collected by Mr. Littlejohn. This figure referred to measures 39.4 by 25.0. These are proportions differing considerably from actual measurements of eggs. The tipping of an egg in photographing it might cause more or less shortening in the resulting print but could not account for all the discrepancies in the figure in the British Museum Catalogue. Some doubt is therefore cast upon the authenticity of what appears to be the only illustration of the egg of the Aleutian Sandpiper.

The eggs of the Purple Sandpiper, according to Oates (*ibid.*, p. 56), vary in length from 39.2 to 34.2, and in breadth from 27.8 to 25.8 (measurements converted to millimeters). Thus the eggs of the Pribilof Sandpiper appear to be larger than of either of the other species of the genus, a fact which would be expected from the size of the bird.

It will be interesting to enumerate the sets of eggs of the Pribilof Sand-

piper known to be in existence at this date, because they remain sufficiently rare to attract attention among collectors. In making up the following list it is realized that omissions have probably occurred, but all of the information I possess on the subject is recorded.

U. S. National Museum	2 sets	One from Elliott, one from True and Prentiss. (See Palmer, <i>Avif. Prib. Is.</i> , etc., p. 404.)
Calif. Academy Sciences	14 sets	From G. Dallas Hanna
Harold Heath	2 sets	
J. Hooper Bowles	1 set	From Dr. Heath
A. C. Bent	1 set	From H. P. Adams
H. P. Adams	1 set	
G. Dallas Hanna	2 sets	Held temporarily
Total .....	23 sets	

The young birds leave the nest very soon after they have hatched, and their coloration matches that of the tundra so exactly that they are almost invisible. It is only when they are frightened suddenly that they move and thereby can be seen. They then run away with a plaintive "cheep, cheep," the mother bird at the same time frantically feigning injury to attract the visitor to herself. She is much more solicitous of a young bird than of her eggs. The male at such times may usually be seen perched on a "niggerhead" not far away spreading one wing to the breeze.

So far as known, the food of both old and young consists of beetles and flies while the birds remain on the highlands; when they move to the ponds and sea shores they eat copepods, amphipods, etc. The United States Biological Survey has been supplied with a large series of stomachs from which it is hoped a report as to the exact nature of the food may soon be forthcoming.

The action of Ridgway (*Birds of N. and Mid. Amer.*, VIII, 1919, p. 244) in considering the Pribilof Sandpiper a distinct species as originally designated, and not a subspecies of the Purple Sandpiper as was done by the A. O. U. Committee, seems entirely justifiable so far as field observations are concerned. No difficulty has been experienced in differentiating it from the Aleutian bird (the nearest counterpart of the Purple Sandpiper on the west coast) when the two are found together in the same flock. The dark colors, small size, and apparently much more rapid flight of the Aleutian would seem to indicate that it even should be considered specifically distinct and not a subspecies of the Pribilof bird.

As soon as the young birds are well able to fly they resort to the tide pools and small ponds near the sea. Later the older birds join them and the flocks increase in size to several hundred in favorable places. This takes place in August and September in such localities as the Salt Lagoon of St. Paul Island. The moult of the breeding plumage takes place slowly, and winter dress is not completely assumed until the birds are about ready to leave for the south on the fall migration. This takes place slowly and gradually during the latter part of September and October.

The birds possess some economic importance to the natives of the Pribilofs and they have occasionally been eaten in the officers messes. Their habit of congregating in fairly compact flocks and their fearless unassuming nature make them easy targets. For this reason close watch should be kept of the numbers returning annually and should any noticeable diminution take place

strict protective measures can and should be invoked. This is possible because the islands are under strict governmental control as regards all wild life. Because of its limited range it would not be a difficult matter to completely exterminate the species. Special protective measures at this time, however, are not believed to be essential because there is even less hunting now than there has been for fifty or more years. The introduction of live stock and reindeer for fresh food removes in large measure the necessity for shooting and the native is ordinarily too indolent to hunt unless he has to do so for food.

It should be added that the Pribilof Sandpiper has an esthetic appetite, which should appeal to most people. Unlike the other common shore birds, the turnstones, phalaropes, pectorals, sharp-tails, and even that much flaunted prize, the golden plover, they do not visit the carrion fields of rotting seal carcasses for fly larvae. These other birds feed there in large numbers and assume a rank fishy taste from the seals.

*San Francisco, California, December 24, 1920.*

## NOTES FROM SOUTHERN ARIZONA

By H. H. KIMBALL

**A**LTHOUGH the season of 1918 was the second of two exceptionally dry years in southern Arizona, bird life was fairly abundant in suitable localities and a number of interesting birds were taken by the writer during that year and subsequently. Four localities are involved.<sup>1</sup>

### VICINITY OF TUCSON

**Glaucidium phalaenoides.** Ferruginous Pigmy Owl. In the foothills of the southern slope of the Catalina Mountains, a single specimen was taken on May 9, 1918, a female which would have laid its first egg in a few days. The bird was in a mesquite tree, where it was taking advantage of the first warming rays of the morning sun, after the manner of pigmy owls. Evidently quite rare in that vicinity.

**Peucaea cassini.** Cassin Sparrow. Probably uncommon near Tucson since only one was seen. (H. C. O.)

**Petrochelidon lunifrons melanogaster.** Mexican Cliff Swallow. A single specimen, the only one seen, was taken April 10, 1918, from a mixed flock of Cliff, Rough-winged, and Violet-green swallows, the latter predominating.

**Petrochelidon lunifrons hypopolia.** Gray-breasted Cliff Swallow. Two specimens, April 15 and 18 (H. C. O.), 1918.

**Riparia riparia.** Bank Swallow. The only one observed was taken from a mixed flock of swallows April 15, 1918. (H. C. O.)

**Hylocichla guttata sequoiensis.** Sierra Hermit Thrush. Two specimens were taken near the Santa Cruz River, ten miles south of Tucson, March 18 and April 18, 1918. (H. C. O.)

### CHIRICAHUA MOUNTAINS

**Sayornis phoebe.** Phoebe. A strange, clear, pleasing note heard October 6, 1918, was ascribed to a *Sayornis*, but the bird was not taken until October 8, when it was discovered on a fence post a short distance below Paradise, on the east slope (H. C. O.). Another was secured near the same place August 16, 1919.

<sup>1</sup>Acknowledgment is due to Dr. H. C. Oberholser for identifying such of the specimens recorded in this article, as are indicated by "(H. C. O.)", and to Mr. J. Eugene Law for rewriting this article from notes furnished.



**Spizella atrogularis.** Black-chinned Sparrow. A male with enlarged testes was taken near Paradise, June 23, 1919. Females and males without the black chin were taken from September, 1918, to February, 1919. (H. C. O.)

**Junco mearnsi mearnsi.** Pink-sided Junco. A few were noted in company with other species of junco near Paradise. One was secured February 13, 1919. (H. C. O.)

**Progne subis subis.** Purple Martin. A colony of martins was found nesting or about to nest in a large dead pine tree in Barfoot Park, high on the west slope. Another colony was found nesting near Rustler Park on the east slope. Thinking that these birds might be the same as those found nesting by the writer in the pines of the Sierra Madre Mountains of Chihuahua, two females were secured and have been pronounced *P. s. subis* (H. C. O.). These birds do not nest in any other mountain range in southeastern Arizona.

**Bombycilla cedrorum.** Cedar Waxwing. A female taken September 27, 1918, near Paradise showed evidence of late nesting, for the whole abdominal region was bare of feathers. Juvenals in the streaked plumage were taken on the same day. Birds were also observed in 1919. Of regular occurrence in the fall and winter months in the mountains of southeastern Arizona.

**Setophaga ruticilla.** American Redstart. A male in excellent adult plumage was taken at about 5500 feet altitude in Cave Creek Canyon, September 11, 1918.

**Sitta canadensis.** Red-breasted Nuthatch. One specimen was taken from a sycamore at about 5400 feet, October 1, 1919.

#### VICINITY OF WILLCOX

**Otocoris alpestris leucansiptila.** Yuma Horned Lark. Two specimens were taken March 8, 1919. (H. C. O.)

**Otocoris alpestris enthymia.** Saskatchewan Horned Lark. Specimens taken in winter. (H. C. O.)

**Otocoris alpestris aphrasta.** Chihuahua Horned Lark. The common winter bird. (H. C. O.)

#### VICINITY OF YUMA

**Myiarchus cinerascens cinerascens.** Ash-throated Flycatcher. Resident in small numbers during the winter.

**Molothrus ater obscurus.** Dwarf Cowbird. Occurs in large flocks in Yuma during January and February. A flock observed February 19, 1920, must have contained four hundred birds. Another flock on February 10 included some Brewer Blackbirds and a single Red-wing, the only one of the latter observed. The fields of Kafir corn furnish the favorite food of these birds. English Sparrows, Ground Doves, Abert Towhees, and Horned Larks also eat this corn.

**Vermivora celata sordida.** Dusky Warbler. Evidently a winter visitant to the Colorado Valley. One was taken near Yuma, December 20, 1918, and two others observed later.

*Yuma, Arizona, February 20, 1920.*

## THE SITKAN RACE OF THE DUSKY GROUSE

By H. S. SWARTH

(Contribution from the Museum of Vertebrate Zoology of the University of California)

THE DUSKY GROUSE of southeastern Alaska has heretofore passed under the name of *Dendragapus obscurus fuliginosus* (Ridgway), but examination of adequate material shows it to be sufficiently different from that subspecies to merit a separate appellation. The distinctive characters of the race have been noted before. Grinnell (Univ. Calif. Publ. Zool., vol. 5, 1909, p. 204) remarks upon the "rich hazel" coloration of the female Alaskan grouse as "the extreme manifestation of *fuliginosus* characters". The present writer, comparing a series of grouse from Vancouver Island with others from Alaska, comments upon certain "conspicuous differences of coloration" (Swarth, Univ. Calif. Publ. Zool., vol. 10, 1912, p. 21). Recent study of additional material from the northwest confirms the existence of these differences, emphasizing the desirability of affixing a name to the race from southeastern Alaska.

There is no material available from the type locality of *Dendragapus obscurus fuliginosus*, "Cascade Mountains, at foot of Mt. Hood, Oregon" (A. O. U. Check-List, 1910, p. 138), but birds from Vancouver Island have been assumed to be representative of that subspecies. There are in this Museum seventeen skins of *Dendragapus obscurus fuliginosus* from Vancouver Island. There are also seven skins from the mountains of northwestern California that are to be referred to *fuliginosus*. Of the Alaskan subspecies there are twenty-eight specimens available.

***Dendragapus obscurus sitkensis*, new subspecies**

## Sitka Grouse

*Type*.—Female adult; no. 9788, Mus. Vert. Zool.; Kupreanof Island, 25 miles south of Kake Village, at southern end of Keku Straits, southeastern Alaska; April 29, 1909; collected by H. S. Swarth; original no. 7267.

*Diagnosis*.—Most nearly like *Dendragapus obscurus fuliginosus*. Adult male not appreciably different from the male of *D. o. fuliginosus*. Adult female and immature of both sexes, as compared with those of *fuliginosus*, much more reddish in general coloration. This color feature affects practically all the plumage except some limited areas, as the slaty-colored abdominal tract, the chin and throat, and the unmarked and generally concealed portions of the remiges and rectrices. The predominant color dorsally is close to pecan brown (Ridgway, *Color Standards and Color Nomenclature*, 1912, pl. 28). Individual feathers are barred with black and brown, and are brown tipped. On head and neck brown predominates, the narrow black bands being almost entirely hidden. Upper tail coverts and central rectrices are conspicuously of this reddish brown color. Breast and sides are mostly pecan brown and black. There are conspicuous white spots on sides of breast and flanks. Tarsus brown.

Female *fuliginosus*, in comparison, is colored as follows: The upper parts are a duller brown with a great deal of black showing through and with the brown everywhere sprinkled with black or gray. There are no pure reddish brown areas as in *sitkensis*. The neck above is predominantly grayish; upper tail coverts and remiges are mostly grayish. Breast and sides are mostly gray and black, with very little reddish. Feathers on sides of breast are dull brownish, mottled with black and tipped with white. Flanks are mostly grayish. Tarsus gray.

*Distribution*.—This grouse inhabits parts of the Sitkan district of southeastern Alaska. Specimens are at hand from the following islands of the Alexander Archipelago: Admiralty, Baranof, Chichagof, Kupreanof, Etolin, Mitkof, and Wrangell. (For details of distribution see Swarth, Univ. Calif. Publ. Zool., vol. 7, 1911, pp. 56, 155, map, fig. 2.)

*Remarks.*—Female grouse from island localities in southeastern Alaska are uniformly of the reddish coloration described. There are two specimens at hand, an adult male and an adult female, from Glacier Bay, the only mainland point represented. These apparently are to be referred to *sitkensis*, but the female is appreciably less red than any of the island birds.

A form of dusky grouse is known to occur on the Queen Charlotte Islands, which lie midway between Vancouver Island and the Alexander Archipelago (Osgood, N. Am. Fauna, 21, 1901, p. 42), but whether *fuliginosus* or *sitkensis* I do not know. I have seen no specimens from those islands.

*Berkeley, California, December 17, 1920.*

## FURTHER NOTES ON BIRDS OBSERVED NEAR WILLIAMS, ARIZONA

By ALEXANDER WETMORE

IN LATE WINTER and early spring of 1907 the writer made a collection of birds at Williams in northern Arizona, and later published observations on this work in which were given notes on 40 species (Kansas University Sci. Bull., vol. IV, no. 19, Sept., 1908, pp. 377-388). During the summer of 1918, I was in Williams again from July 6 to July 17, and, though engaged in writing certain reports, had opportunity during morning and evening of the long summer days to make observations on the bird life and to do some collecting. The list of birds observed as given herewith is far from exhaustive but supplements the notes published previously as it enumerates many of the breeding birds to be found in the vicinity. Advantage has been taken of the present opportunity to review the collection of skins made in this region in 1907 and to make certain changes in subspecific identifications in accordance with present day views in this ever shifting subject. In certain cases, however, it has been deemed inadvisable to take up the matter of subspecific forms.

The town of Williams is placed at the base of Bill Williams Mountain. A series of broken hills covered with yellow pine, scrub oaks, and mountain mahogany lie south and west of the village at the base of the mountain, while on the north is a level area forming part of the Coconino Plains. Zonal conditions about the town may be described as Transition, with Canadian zone on the mountain above. The boreal elements of the latter are found in north gulches at a comparatively low altitude. The upper Sonoran zone spreads over the flats to the north and is found to the west in descending the mountain below Supai. As may be imagined there had been considerable change in local conditions during the years that had elapsed since my last work here. The surrounding country had been divided into small ranches, with considerable areas under cultivation and more of the pine timber had been cut away. Some of the more notable changes brought about in the bird life are noted in the list that follows.

A number of birds seen during late winter and early spring in 1907 were not found in summer in 1918. These are enumerated here to complete the list given below. Following are the additional species:

*Buteo b. calurus*, *Sphyrapicus v. nuchalis*, *Sphyrapicus thyroideus*, *Asyndesmus lewisi*, *Otocoris a. leucolaema*, *Aphelocoma woodhousei*, *Cyanocephalus*

*cyanocephalus*, *Sturnella m. hoopesi*, *Carpodacus cassini*, *Spinus p. pinus*, *Pooecetes g. confinis*, *Junco h. hyemalis*, *Junco h. mearnsi*, *Junco caniceps*, *Junco o. shufeldti*, *Lanius l. excubitorides*, *Oreoscoptes montanus*, *Certhia f. montana*, *Baeolophus i. griseus*, *Psaltiriparus plumbeus*, and *Regulus c. calendula*. These make a total of 65 species of birds observed by the writer in this locality.

1. *Zenaidura macroura marginella* (Woodhouse). Western Mourning Dove. Fairly common. One seen July 7 and several noted on July 9 and 11.

2. *Falco sparverius phalaena* (Lesson). Western Sparrow Hawk. Fairly common. Seen daily from July 7 to 14.

3. *Dryobates villosus leucothorectis* Oberholser. White-breasted Woodpecker. Common on the slopes of Bill Williams Mountain. A brood of young out of the nest but still under the care of their parents seen on July 8. Three specimens secured here in 1907 have the following wing measurements: Male (March 19) 124 mm., female (March 2) 126 mm., female (March 8) 122 mm. In the male two or three of the outer median wing coverts have narrow streaks of white along the shaft. In the first female mentioned above all of the outer median coverts are conspicuously marked with white and there is a white spot on one of the lesser coverts. The third specimen has the white limited to a very narrow linear spot not more than two millimeters long on one median covert in either wing.

4. *Balanosphyra formicivora aculeata* (Mearns). Mearns Woodpecker. This species was common among the oaks on the level flat west of town and also in similar growth south of Williams around the eastern base of Bill Williams Mountain. Young fully grown were seen on my arrival. I found this woodpecker shy and secretive at times so that it frequently hid behind limbs and remained motionless for long periods in order to escape observation. One evening at dusk several were greatly excited when I was "squeaking" in an endeavor to call up an owl.

5. *Colaptes cafer collaris* Vigors. Red-shafted Flicker. This Flicker was common among the yellow pines throughout the region. On July 9 I noted that young birds were apparently fully grown.

6. *Chordeiles virginianus henryi* (Cassin). Western Nighthawk. The Nighthawk was common about Williams and numbers were seen coursing low over the ground along side streets at dusk. On July 11 one was heard booming in the canyon south of town.

7. *Selasphorus rufus* (Gmelin). Rufous Hummingbird. This species appeared in numbers on July 13 and had evidently just arrived in migration as none had been observed previously. The birds were feeding at a large gentian, probing one or two flowers at a time and then pausing to rest for a minute or two on a twig. They continued to feed until it was so dark that I had some difficulty in finding my way down over the rocks out of the narrow gully in which I had been watching them. In flying their wings made a subdued humming and the birds called *cheep cheep* in a low tone. All that were seen on this occasion were males, but on the next evening, July 14, I observed several females. Specimens were taken.

8. *Selasphorus platycercus* (Swainson). Broad-tailed Hummingbird. This hummer was fairly common about the base of Bill Williams Mountain and was observed daily. An adult male was shot on July 7 and others were observed until July 14.

9. *Tyrannus vociferans* Swainson. Cassin Kingbird. A few of these Kingbirds were found about scattered yellow pines in the areas south and west of Williams. Two pairs frequented tall pines standing in the streets of the town where their loud notes were heard morning and evening.

10. *Nuttallornis borealis* (Swainson). Olive-sided Flycatcher. The Olive-sided Flycatcher was common in the small gulches on the north and east slopes of Bill Williams Mountain. While no nests were observed, the birds were evidently paired and specimens taken on July 14 were in breeding condition. A female was secured on this date that had deposited eggs. The birds were observed daily from July 7 to 14. Usually they were found perched in the tops of the tallest dead pines, but on occasion they alighted among the limbs of living Douglas fir. In feeding they were very active and then often descended for short periods to lower perches. I found that each bird had favorite posts for observation and shifted about from one to another. Their call notes were heard at intervals during the day and at evening came continually from the mountain sides, one of the few bird voices that was heard in the dusk of the canyons as the

sun was descending behind the shoulder of the mountain. The most common note was a loud *pip pip* that in pitch, cadence, and insistence reminded one of the call of some young bird, while another more musical call sometimes given while flying was *pray teer* varied occasionally to *whit pray teer*.

11. *Myiochanes richardsoni richardsoni* (Swainson). Western Wood Pewee. Common.

12. *Empidonax difficilis difficilis* Baird. Western Flycatcher. One was seen July 7 in the gulch south of town at an altitude of about 7500 feet.

13. *Cyanocitta stelleri diademata* (Bonaparte). Long-crested Jay. This species was common in areas where there were coniferous growths. By July 9 I noted that the young were fully grown.

14. *Sturnella neglecta* Audubon. Western Meadowlark. The Western Meadowlark was fairly common in the open country north of Williams. This species was not noted here in 1907 and so may have come in with increased cultivation of the land as has happened elsewhere in the west. Search was made for *Sturnella magna hoopesi*, the only meadowlark present here in 1907, but none could be found. This brings up an interesting question as to the possibility of this form having been replaced by the Western Meadowlark through a change in ecological conditions. In this connection I may add that specimens collected here in 1907 leave no doubt as to the former presence of the Texas Meadowlark.

15. *Passer domesticus* (Linnaeus). English Sparrow. Since its arrival in 1907 (as noted in my previous account, p. 383) this species has increased until it is fairly common about the streets of Williams.

16. *Carpodacus mexicanus frontalis* (Say). House Finch. Individuals were seen about the Camp Clover Ranger Station, west of Williams, on July 13, and near a ranch south of Williams on July 14.

17. *Loxia curvirostra stricklandi* Ridgway. Mexican Crossbill. Crossbills were observed at about 8000 feet on Bill Williams Mountain on July 7, and one was seen among the broken hills south of town on July 11.

18. *Astragalinus psaltria hesperophilus* Oberholser. Green-backed Goldfinch. Fairly common in open localities near Williams and breeding in the shade trees in town. On July 9 two pairs were feeding on the seeds of a composite (*Hymenopappus scaposus*) on a rocky hillside near the dam above town. The birds flew to perches on stones, climbed onto the plant stems, which were from six to ten inches tall, and then sidled out quickly along them as they slowly bent toward the ground. When the seed head was reached it was torn open without hesitation and the birds began at once to eat.

19. *Chondestes grammacus strigatus* Swainson. Western Lark Sparrow. These sparrows were fairly common in open country west and south of town. Recorded on July 10, 13 and 14.

20. *Spizella passerina arizonae* Coues. Western Chipping Sparrow. Common.

21. *Junco phaeonotus dorsalis* Henry. Red-backed Junco. This Junco bred in small numbers on the slopes of Bill Williams Mountain and in the broken region at its eastern base. A breeding female was collected July 7. On July 11 a pair were much excited by "squeaking".

22. *Pipilo maculatus montanus* Swarth. Spurred Towhee. This species was fairly common among the broken hills covered with scrub oaks. A breeding female was taken on July 11.

23. *Zamelodia melanocephala* (Swainson). Black-headed Grosbeak. This Grosbeak was common on the lower slopes of Bill Williams Mountain. Males were still singing and were heard calling and scolding at intervals. On July 7, at an altitude of about 7800 feet I found a nest resting on a horizontal limb against the trunk of a slender oak, about five feet from the ground. The male was on the nest brooding four young from four to six days old. These young had down of a dull white color on the head and back. The open mouth was outlined in bright yellow. The nest was composed of grass and weed stems and was rather flat though the cup was deep enough to contain the young readily.

24. *Piranga ludoviciana* (Wilson). Western Tanager. The Western Tanager was common on the slopes of Bill Williams Mountain and about its base and was breeding. Males were heard singing from the tops of the yellow pines and though not wild

usually slipped away when I tried to get directly under them. An immature bird in juvenal plumage recently from the nest was taken on July 14.

25. *Piranga hepatica oreophasma* Oberholser. Hepatic Tanager. This fine tanager was fairly common among the low yellow pines remaining among the broken hills south of Williams around the eastern base of Bill Williams Mountain. The birds were breeding here, as was shown by the condition of females taken, and were found usually in pairs. In feeding they worked methodically, flying from tree to tree, the male showing a flash of red in passing. Usually they alighted among the lower limbs and then worked out on the tips of the branches, fluttering up from limb to limb toward the top. Once a male dropped to the ground after an escaping insect. On one occasion I saw a male feeding a female and shot her under the impression that she was a young bird. The male of this pair was still in immature plumage but was molting and had developed a few red feathers. The call note of this species was a soft *chewp chewp* that curiously enough was very similar to the call of the Porto Rican Tanager (*Nesospingus speculiferus*).

26. *Progne subis subis* (Linnaeus). Purple Martin. A pair of these martins was observed about Williams on July 6 and 7, and on July 9 two pairs were circling over the canyon south of town.

27. *Tachycineta thalassina lepida* (Mearns). Northern Violet-green Swallow. This species was fairly common and several pairs nested in the canyon south of town. They were seen in the evening hawking for insects or resting on telephone wires.

28. *Vireosylva gilva swainsoni* (Baird). Western Warbling Vireo. These birds were seen among quaking aspens on July 8 and 14.

29. *Lanivireo solitarius plumbeus* (Coues). Plumbeous Vireo. Plumbeous Vireos were fairly common among oaks and aspens near Williams.

30. *Vermivora virginiae* (Baird). Virginia Warbler. This species was fairly common in occurrence. On July 7 a female was flushed from a nest among scrub oaks on the lower slopes of Bill Williams, but the nest could not be found. A male was heard singing on July 9. On July 14 I found a brood of fully grown young still in company with their parents. They were very active in working through the limbs of oaks and pines, and constantly twitched the tail up and down, a very characteristic motion. All were silent.

31. *Dendroica aestiva* (Gmelin). Yellow Warbler. A male was seen in the canyon south of Williams on July 8 and another on July 14. Neither of these birds was secured. It was believed that they were migrants.

32. *Dendroica auduboni auduboni* (J. K. Townsend). Audubon Warbler. Common. Males were in song as late as July 14.

33. *Dendroica graciae* Baird. Grace Warbler. These birds were found in small numbers among the yellow pines and oaks in the canyon south of Williams. At this season males were not singing, so that it was difficult to locate them, as the birds, though quick and active, are very small. On July 8 several were seen and breeding males were collected in an area of yellow pine forest with an undergrowth of scrub oak. Several came down and scolded at me sharply.

34. *Dendroica nigrescens* (J. K. Townsend). Black-throated Gray Warbler. A male was singing among oaks on the slopes of Bill Williams Mountain at an altitude of 7300 feet on July 7.

35. *Salpinctes obsoletus obsoletus* Say. Rock Wren. Common. Broods of grown young were seen on July 6 and July 11. These immature birds had a number of odd, bizarre call notes that several times deceived me into following them in hope of discovering some other species. They were tame and came fearlessly within a few feet of me, peering about under the rocks, examining the smallest cracks and squeezing in and around small crevices.

36. *Catherpes mexicanus conspersus* Ridgway. Canyon Wren. Fairly common around Bill Williams Mountain. On July 8 a female was found feeding young in the canyon south of town. The young, three in number, though not fully fledged, had left the nest and reposed at the bottom of a cleft in the rock in a space two inches wide. Here they dozed in semi-darkness while awaiting the coming of food. The labor of caring for them seemed to be left entirely to the female, though the male was in the vicinity. The female came and went fearlessly carrying food, in the form of brown crickets with elongated antennae, paying little attention to me as I peered in the crevice with my face

barely two feet away. After feeding she carried away excrement exactly as though the young were in the nest. The young were able to climb up and down the steepest rock surfaces with no difficulty whatever. When placed in the open, they became more alert and after a minute or so clambered away toward shelter. The heat of the sun, though apparently mild, affected them severely so that they panted heavily and closed their eyes seeming almost overpowered; it is probable that never before had they felt its rays. The call note for food was a faint *tsee tsee*.

Two specimens secured at Williams in 1907 were identified in my previous paper as *Catherpes m. polioptilus*, after comparison with the very inadequate series of other Canyon Wrens at hand in my collection and in that of the Museum of the University of Kansas. Further study of these two birds, however, seem to indicate that they are intermediate between *C. m. conspersus* and *C. m. polioptilus* (the latter apparently being in itself a somewhat indefinite, poorly characterized series of intermediate groups). The birds in question are a female taken March 4, and a male March 21, 1907, both secured in the canyon south of Williams. The male is slightly darker above than the female, in this verging slightly toward *polioptilus*. It is large enough also to be included in the lower range of measurements of that form. The female, paler in color, agrees with *conspersus*, and is too small to come within the range of measurements of *polioptilus*. Viewed from above both specimens have the head almost imperceptibly darker than in *conspersus*. On the other hand the back is distinctly paler than in *polioptilus*. After careful consideration it has seemed that the two are slightly nearer *conspersus* and they are placed with that form.

37. *Troglodytes aedon parkmani* Audubon. Western House Wren. Fairly common. Nearly fledged young were found in a hole in an oak stub on July 11.

38. *Sitta carolinensis nelsoni* Mearns. Rocky Mountain Nuthatch. Common on the slopes and around the base of Bill Williams Mountain. A brood of fully grown young was seen July 8. The notes of this form are slurred and are given less clearly and sharply than the calls of the eastern subspecies.

39. *Sitta pygmaea pygmaea* Vigors. Pygmy Nuthatch. Common. A brood of young out of the nest was noted on July 10.

40. *Penthestes gambeli gambeli* (Ridgway). Mountain Chickadee. Common on Bill Williams Mountain.

41. *Hylocichla guttata auduboni* (Baird). Rocky Mountain Hermit Thrush. One was heard singing on July 14 high up on Bill Williams Mountain.

42. *Planesticus migratorius propinquus* (Ridgway). Western Robin. Robins were common in the town of Williams and in the surrounding region. Young just from the nest were seen on July 11 and 12.

43. *Sialia mexicana bairdi* Ridgway. Chestnut-backed Bluebird. Common. A few pairs were seen in the streets of town; and in the country this was the most common bluebird. Young fully grown but still in juvenal plumage were noted from July 10 to 14. On the latter date young were very common.

44. *Sialia currucoides* (Bechstein). Mountain Bluebird. Fairly common.

*Biological Survey, Washington, D. C., May 26, 1920.*

## FROM FIELD AND STUDY

**Late Fall Occurrence of the Lutescent Warbler at Berkeley.**—A notable feature of bird life in the San Francisco Bay region during the current fall and winter season has been the loitering of Orange-crowned or Lutescent warblers (perhaps both) for a considerable period beyond their usual dates of disappearance.

On October 31, I found a bird dying in Faculty Glade on the University of California Campus, which was identified by Dr. Grinnell as a Lutescent Warbler (*Vermivora celata lutescens*). The specimen, now no. 39703, is preserved in the California Museum of Vertebrate Zoology. This postdates the previous record for this location by some 36 days.

On October 14, November 1, and November 15, and on intermediate dates not re-



corded, one bird and sometimes two, apparently like the Campus bird, were observed feeding in my rose garden on Grove Street near Cedar in Berkeley, and also in the high anise growing in a vacant lot next door.

On November 26 I observed a bird of this species in Carmel; this being the only instance at that place, in four successive Novembers in my experience. This bird seemed a trifle larger and may have been a Dusky Warbler.—BESSIE W. KIBBE, *Berkeley, California, December 5, 1920.*

**The Black-throated Gray Warbler in Santa Cruz County, California, in Summer.**—My friend, Mr. John Carroll, formerly an enthusiastic student of ornithology, recently sent me a number of bird skins. Among these is one of an adult male Black-throated Gray Warbler (*Dendroica nigrescens*) which he collected at Brookdale, Santa Cruz County, California, July 5, 1910. This, I believe, becomes the first summer record for that county.—MILTON S. RAY, *San Francisco, November 1, 1920.*

**A Flight of Harris Hawks.**—Mr. Frank Richmond, of El Centro, California, tells me that on October 22, 1920, he observed between 400 and 500 Harris Hawks (*Parabuteo unicinctus harrisi*). They were scattered over an area of about 80 acres in a field along the highway about half-way between Calexico and Heber. The birds perched on posts, hillocks and bare ground, and Mr. Richmond's attention was called to them by a party phoning that a flock of "eagles" was at that particular place. Mr. Richmond killed one of the birds to make sure they were not eagles.—W. LEE CHAMBERS, *Eagle Rock, California, December 6, 1920.*

**Red-bellied Hawk Eats Caterpillars.**—A Red-bellied Hawk (*Buteo lineatus elegans*) caught in a trap set near Firebaugh, Fresno County, California, was recently received by the Museum of Vertebrate Zoology. In the stomach there were a number of insect remains. These were sent to Dr. E. C. Van Dyke, who identified them as larvae of the hawk moth (*Pachysphinx modesta*). This caterpillar when full-grown is from two to two and one-half inches in length, of a light green color, with yellow lines on the head and along the sides of the body, and feeds on various species of willow. Eight of these caterpillars were found in the hawk's stomach together with the remains of two mole crickets (*Stenopelmatus*, sp.), one beetle (*Coniontis*, sp.), one ground beetle (unidentified), and some grass and pieces of wood that doubtless were picked up with the food.—HAROLD C. BRYANT, *Berkeley, California, November 24, 1920.*

**Ring-necked Duck Again from near Corona, California.**—I wish to report the capture of an adult male Ring-necked Duck (*Marila collaris*) on December 9, 1920, on the grounds of the Pomona Recreation Club, near Corona, California. The bird was shot by Mr. A. P. Hapwood, of Upland, and was brought to me for identification. The bird was one of a band of four, all likely of the same species. This duck seems to be a rather rare visitor in this locality, as during several years of hunting on this Club I only collected this species once (see CONDOR, XVIII, 1916, p. 85).—WRIGHT M. PIERCE, *Claremont, California, December 11, 1920.*

**A Record for the Emperor Goose in Oregon.**—On December 31, 1920, while collecting birds along the ocean beach at Netarts, Tillamook County, Oregon, I came upon a number of Glaucous-winged and Western Gulls around the mouth of a small creek, and in their midst was an Emperor Goose, *Philacte canagica*. When I drew nearer to the group and dismounted from my horse, the gulls took wing but the goose walked leisurely toward the ocean. When quite close I shot it. It proved to be a female. This, I believe, is the first published record of the species for Oregon.

Referring to the Emperor Goose, Coues (Key to N. Amer. Birds, fourth edition) remarks: "Its flesh is rank and scarcely fit for food." I found, however, that while less fat than other species of geese, the flesh of this individual was very palatable.—ALEX WALKER, *Blaine, Oregon, January 24, 1921.*

**European Widgeon in Santa Barbara County.**—I wish to report the taking of an adult male specimen of the European Widgeon (*Mareca penelope*) by Mr. R. G. Fernald

of Santa Barbara. The bird was shot upon the grounds of the Guadalupe Gun Club at Guadalupe, Santa Barbara County, California, January 14, 1921, and was shipped to me in the flesh for mounting. It was in full plumage, with a marked development of coloration. The carcass, and such parts of the skeleton as were not required for mounting, were forwarded to the University of California Museum of Vertebrate Zoology, with the hope that they might prove of value to the research department there.—A. E. COLBURN, *Los Angeles, California, February 5, 1921.*

**A Feeding Habit of the Varied Thrush.**—From a ground-floor window of the Museum of Vertebrate Zoology, one commands a view of a bit of ground made shady and leaf-matted by a little grove of planted *Pittosporum* which hugs the eastern side of the building. Abundant rains this winter have kept this leaf-mat water-logged.

Here on January 10, 1921, I watched a Varied Thrush, presumably subspecies *naevius* of *Ixoreus naevius*, as it foraged among the dead leaves. For a little of the time the bird was working within ten feet of my eyes.

Its constant mode was as follows: A short jump forward as it grasped debris in its beak, and a return jump so immediate that the whole was almost a single movement. A clump of debris, sometimes quite a clod, flew backward at one side or the other with each return jump. Usually the debris described a low arc, landing ten or twelve inches away, sometimes more, frequently less. Often successive plucks landed material on alternating sides of the bird with a slight corresponding change of body axis in each succeeding pause. Perhaps as often the leaves were landed for several times successively on the same side of the bird. Each pluck was followed by a moment of "frozen" pause, with head at about body level, after which the bird either repeated the operation or proceeded to devour the food which it had uncovered.

There was no movement of the wings and I was unable to perceive any intentional moving of debris by the feet. Naturally, tiny bits were occasionally disturbed by a claw in the backward jump. But, as a matter of fact, the feet rarely touched the leafy carpet once the bird had started, for it "swept" a rather clean swath down to dirt, like a carelessly shovelled path through the snow. This path was roughly three to five inches wide and decidedly tortuous, and the bird at times even reversed its progress to work over ground already cleaned, and to later start off on a side tangent.

Food seemed to be abundant as the bird picked up and swallowed frequently, apparently tiny morsels and good sized morsels, though I could not determine their exact nature. From its manner of picking and swallowing I guessed that it was eating such lower insect life as was uncovered, and possibly vegetational germinations which look so grub-like. Later I examined this ground, and found, when the leaves were scratched away, an abundance of worm and insect life, mostly larval, and some tiny plant germinations as well.

Naturally a "path" like this bird made would only occur in just such a situation, viz., a complete mat of dead leaves, water-soaked, and with abundant food concealed in and beneath them. Birds working on sod or bare earth concentrate their efforts on scattered spots, and often spend some moments on one hole, making the dirt fly as did the leaves.

On January 15, another bird which I watched from the same station, confirmed this manner of feeding. It moved even greater masses of material (variable moisture content no doubt affects the tenacity of the leaf mat), and at one time pulled away a leaf mass as big as its body. Once, when activity indicated a big morsel, a jay (*Aphe-locoma californica ocleptica*) suddenly descended from the tree above, and would surely have alighted on the thrush's back had not the latter scooted off just in time. Two rods away the thrush at once proceeded with its feeding. I noted, too, that the jay had arrived an instant late, and after a disappointed scrutiny of the "diggings" it flew.—J. EUGENE LAW, *Berkeley, California, February 16, 1921.*

**Anent Red-winged Blackbirds.**—About a year ago, after considerable urging on the part of ornithological friends (?), I undertook a somewhat comprehensive study of the races of the *Agelaius phoeniceus* group, with the idea of possibly being able to find some more exact formulae for their determination and of perhaps being able to consolidate some of the present subdivisions. This work has been carried on as opportunity

permitted, but there have been many and often long-continued interruptions caused by field trips and various other matters demanding attention. However, hundreds of Red-wings have been examined and measured in various ways, and all these measurements have been carefully tabulated. Ratios of certain parts to others have been worked out in the endeavor to find some system that might assist us to describe or to determine the different subspecies with greater ease, especially in the winter plumages. The results of all this work have been far from satisfactory, from my own point of view.

Unfortunately the conclusion has been forced upon me that this undertaking must be abandoned, at any rate for the time being, for the reason that there is so much other work that must no longer be delayed, and which will occupy the greater portion of my time for months to come, with new matters constantly arising to take up what little time there might otherwise be to spare. Hence it seems to me that the only thing to do is to accept the situation gracefully and to leave the field clear to any ambitious mortal who may allow himself to be drawn into this alluring but treacherous current.

There is one point, however, that I would like to touch upon in this short paper before dropping the subject. This is that the Bi-colored Blackbird, *Agelaius gubernator californicus* Nelson, or *A. phoeniceus californicus* as I believe it should be (J. Mailliard, Condor, XII, 1910, p. 66), was described from an intermediate bird. The type specimen is a female, from Stockton, San Joaquin County, California, with the wing of a male tied to it (*Agelaius phoeniceus B. gubernator* [Ridgway] Belding). Now it has been shown (J. Mailliard, loc. cit.) that the Red-wing inhabiting the country at the junction of the Tuolumne and San Joaquin rivers, about forty miles south of Stockton, approaches the San Diego Red-wing (*Agelaius phoeniceus neutralis*); yet the bird found near Stockton in a similar type of country, with no climatic or topographical barrier between it and the Tuolumne junction country, comes a great deal closer to the form inhabiting the region about San Francisco Bay whose habitat extends, apparently, as far south as Monterey Bay along the coast, up the coast through Marin and Sonoma counties, and along the inner coast range as far north, at least, as Snow Mountain, Colusa County. The Stockton bird has enough of the characteristics of *neutralis* to be appreciably different: it shows itself to be more or less intermediate, having a heavier bill than the Bay region birds, less black on the middle wing coverts of the males and, on an average, heavier streaking upon the heads and under parts of the females. It is very unfortunate that the latter was not taken as the type of *californicus*, in which case it might be possible to separate out the Tuolumne River race, although this latter seems to be rather variable, as I have taken specimens which were practically identical with others from Stockton. In fact, the Tuolumne River bird appears to be just about midway between the *neutralis* of southern California and the San Francisco Bay Red-wing.

A singular angle in the distribution of these races is that while the intermediate approaching *neutralis* appears to be the one occupying the greater part of the San Joaquin Valley in south-central California, at the extreme southern end of this valley there is an irruption of what is practically *californicus*. Breeding birds from Buena Vista Lake, Kern County, are not easily distinguishable, if at all, from those breeding at Stockton, while birds from Tejon Pass, a little farther south, are also nearer to these than to *neutralis*, which occurs only a little farther south still. It looks as if this southern interpolation of *californicus* must have reached that territory via the valley of the Salinas River and San Juan Creek through the Carriso and Elkhorn plains, from which there are one or two low passes into the San Joaquin Valley.

In taking measurements of Red-wings I have tried to find some way of expressing in more definite terms the differences in the shape of bills, such as thickness for example, by taking the distance from the nostril to end of bill (placing the posterior leg of dividers or calipers, which must be finely pointed for such work, in the actual opening of the nostril to ensure always starting from the same point), then dividing this by two and measuring the width of bill exactly midway between the two points. While this is a very delicate measurement to get exactly, in conjunction with width at base and length of bill it gives a better idea of the slenderness or thickness of the bill than anything else I have tried out. Its chief fault lies in the fact that it is so small a dimension that one or two tenths of a millimeter mean a good deal, and the slight inaccuracies one is liable to fall into while making a measurement so difficult to get exact, are magnified in importance.

Yet when one finds that this measurement in groups of 11 males from Marin County, 10 from Sonoma County, and 8 from Suisun, Solano County, averages 2.6 mm. in each group, while the distance from nostril to end of bill averages respectively 15.1, 15.8, and 16.1 mm., you have something to compare with a group of males (11) from Stockton, which shows the former measurement to be 3.0 and the latter 15.4 mm., making it apparent that the bill of the Stockton bird is appreciably thicker than any of the above groups. Again, a Tuolumne River group of 13 males has 3.3 and 15.2 mm. for these measurements, showing a still heavier bill than the Stockton bird.

While the variations among different groups of the same species may weaken the significance of this data to some extent, it is still valuable when used in conjunction with other characteristics. However, not having had sufficient opportunity to carry on these studies to a conclusion I will not dwell longer upon the subject, but will close by saying that I shall be glad to be of service, if needed, to any one indulging in this pastime.—JOSEPH MAILLIARD, *California Academy of Sciences, San Francisco, January 21, 1921.*

**Pileated Woodpecker versus Cooper Hawk.**—On January 31, 1921, while we were on our way to Mirror Lake, Yosemite Valley, we heard the loud, ringing call of the Pileated Woodpecker. Looking up we saw two rather large birds dashing through the tree-tops. The dark bird with the white wing-patches we recognized at once as a Pileated; the lighter colored bird turned out to be a Cooper Hawk. A pursuit was apparently in progress, but as the birds dashed through the branches of the tall trees it was impossible to be sure which of the birds was the pursuer and which the pursued. Both birds quickly left our range of vision, but a little farther on we heard gentle tappings and soon located the woodpecker. The hawk was there, too, perched on a limb a few feet away. The woodpecker was drilling and prying off chips with apparent unconcern, while the hawk looked on with seemingly hungry eyes. While we were watching, the hawk flew to a branch a few feet above the woodpecker. Pileated tilted his head and gave the hawk a sidelong glance and then deliberately flew toward him and drove him from the tree. With the hawk gone, the woodpecker went on with his drilling as though nothing had happened. Perhaps the hawk saw visions of a good meal, but lacked the courage to attack a bird so well equipped to give battle.—CHAS. W. MICHAEL, *Yosemite, California, February 2, 1921.*

**Two Unusual Winter Records for the San Francisco Bay Region.**—The White-throated Sparrow (*Zonotrichia albicollis*), a rare winter visitor to this region, has once more appeared on the campus at the University of California, Berkeley, after an apparent absence during the winter of 1919-1920. A single individual was observed in company with two Golden-crowned Sparrows foraging in the shelter of shrubbery along Strawberry Creek, December 17, 1920.

On December 19, 1920, a stormy day, with heavy wind, at my home in Oakland, I was attracted by an unusual bird call. I could not identify the bird at this time because it flew too quickly into shrubbery, but subsequent visits proved it to be a Western Mockingbird (*Mimus polyglottos leucopterus*). Other known dates of this bird's visits to my garden, where it has spent most of its time in a large toyon berry bush, are December 26, 1920, and January 2, 16, and 24, 1921. Every visit has been announced by harsh, unmusical call notes.—MARGARET W. WYTHE, *Museum of Vertebrate Zoology, Berkeley, California, February 17, 1921.*

**An Afternoon with the Holboell Grebe.**—In the last issue of the Condor I read an interesting article on the nesting of the Pied-billed Grebe and its habit of carrying its young on its back. The writer of the article, Mr. Bancroft, says that the young were not carried under when the parent bird dived. Perhaps the following passage from my note-book, which treats of this Grebe habit, may be of interest:

On the afternoon of June 24, 1914, I loaded my canoe in the democrat and went with a friend to Silvermore Lake. After launching our canoe we found nine nests of Holboell Grebe (*Colymbus holboelli*), with 2/3, 2/2, 1/6, 3/1 and 1/4 eggs, respectively. While paddling around we noticed a Grebe swimming along with a young one on her back. At times the young bird was almost invisible beneath her feathers and wings as it moved

around. On our approach the parent bird dived with the young one on her back and carried it several yards under water. The young bird came up first and seemed bewildered or lost. We paddled up to it and my friend answered its plaintive peeping, whereupon it swam up to the canoe and into his open hand. We admired the curiously colored little fellow a while and then turned him loose.—A. D. HENDERSON, *Belvedere, Alberta, December 20, 1920.*

## EDITORIAL NOTES AND NEWS

The Cooper Ornithological Club, by amendments to its constitution duly approved by both Divisions in January and February, 1921, has created an executive body to be known as the Board of Governors and to consist of the ex-presidents and the acting officers of the Club. This reorganization seemed expedient in view of the gratifying growth of the Endowment Fund, in order to insure this Fund to the purpose for which it is being created, namely, for the publication of contributions to ornithological knowledge. The Fund itself will insure continuity of output.

Dr. Miller raises some questions in his "communication" in another column which have important current bearing. He urges that great care be taken in levying criticism, either privately or in print, to couch one's terms in courteous phraseology, so that no feeling of personal resentment can possibly be aroused. With this ideal we heartily agree. But it is not an easy thing to accomplish in practice, no matter how carefully one may strive with this very point in view. We believe that honest, outspoken criticism *does* function usefully, even when published (and, we believe, Dr. Miller would readily grant this). Direct, clear criticism is needed now and then, from one authority, of the writings of another. This is stimulating and beneficial, to the lesser students in the same field as well as to each of the principals themselves. If the nicer proprieties have been observed in mode of expression, so much the better. We will welcome contributions to *THE CONDOR* which are wholesomely critical in nature.

Part one of *The Birds of California* has appeared, and parts two and three are announced to come out shortly, with others up to 30 or so to follow. Thus the work so long in hand by Mr. William Leon Dawson has begun to bring tangible results. And no subscriber who has seen this first installment, of 64 pages and a full complement of colored plates, photogravures and text-illustrations, will be disappointed. This is far and away the best thing, from an artistic standpoint at least, that has ever been published concerning western bird-life; and the text is informational and entertaining to a

gratifying degree. We congratulate the author upon the high merits of this initial installment, and extend our earnest wishes that nothing will interrupt the continuity of issue until the entire work is published, with the same plane of excellence maintained throughout.

The natural history collections of Mr. Harold H. Bailey, formerly of Newport News, Virginia, have been moved to Miami Beach, Florida. They will there form the nucleus of a museum soon to be established in conjunction with a zoological park. Exhibits of mounted birds and mammals are planned, as well as a study collection. Five acres of ground have been allotted to the new project, and work has been started on the museum building. Mr. Bailey will be at the head of the museum and of the zoological garden. In connection with his new activities he already has well under way a book upon the birds of Florida, to be of similar nature to his "Birds of Virginia".

A letter received from Dr. Alexander Wetmore, now engaged in field work in Argentina for the United States Biological Survey, contains a suggestion of the many interesting discoveries he is making. Dr. Wetmore arrived at Buenos Ayres on June 21, in the winter season, and proceeded at once to extreme northern Argentina. There his work lay in "the strange and interesting area known as the Chaco, lying west of the Rio Paraguay and extending from northern Argentina north into Bolivia". Later he returned southward with the advent of spring, encountering various Argentine species then on their spring migration *southward* to their breeding grounds, and, still later, toward the end of July, certain North American shore-birds just arriving at their winter home. Brief mention of a falcon with "well-developed powder downs", of an "odd-looking Mimid" with "broad lateral apteria in the feather tracts of the sides of the neck that in life are bright orange yellow in color", and of a teal that habitually perches in trees, gives promise of future accounts of the anatomical peculiarities of tropical birds even more interesting than some Dr. Wetmore has already discovered in certain of our better known North American birds.



Fig. 14. ARETAS A. SAUNDERS

Mr. Saunders' "Distributional List of the Birds of Montana" was issued by the Cooper Ornithological Club under date of February 1, 1921, as no. 14 of the Pacific Coast Avifauna series. The author was for some years connected with the United States Forestry Service in Montana, and he was also for a time at the University of Montana Biological Station at Flathead Lake. His account of the birds of Montana consists largely of his own first-hand observations, but are supplemented by the published writings of other ornithologists. Three hundred and thirty-two species are listed as native to the state, as well as several others that have been introduced. The "List" is mainly concerned with the manner of occurrence of the various species, in just what part of the state they are found, and at what season of the year; but there are also extensive notes on migration, and descriptive accounts of the nesting of most of the birds. A number of half-tones figure many of the species, their nests and eggs, and also illustrate the character of the country in the life zones and faunal areas that are discussed.

Mr. J. A. Munro, of Okanagan Landing, British Columbia, has recently been appointed chief officer in charge of the enforcement of the Migratory Bird Convention Act in the western provinces of Canada. Mr. Munro's years of study of the avifauna of his region have rendered him peculiarly fitted to un-

derstand the problems involved in his new position. It will be gratifying to the ornithologists of the country to learn of this most appropriate appointment.

### COMMUNICATION

#### A PLEA FOR PROFESSIONAL COURTESY

Some time ago, my studies in a certain field led to a discovery quite unexpected to me and of a more or less surprising nature to other men of similar interests. An account of the facts and a statement of conclusions was written for publication, but the manuscript was submitted to another investigator to whom I was personally a stranger. He examined the manuscript and returned it with helpful criticism and a most cordial expression of interest and of willingness to render aid in furtherance of the cause—a willingness which he has since repeatedly proven genuine. His assistance was publicly acknowledged with great pleasure on my part, a cordial relation between two fellow workers was established, and the scientific public was spared any controversy in print.

A few months ago I received a most courteous and friendly letter from an older and better known scientist offering suggestions on a brief note published over my signature. Instead of writing to me he might have published his criticism and done so in less friendly terms without violating the law of precedent. He took the more courteous way and spared the public a possible controversy.

Why are not all scientists as large as these two men? Why is there not among scientists that fraternal bond that exists among reputable physicians and is called professional courtesy? Why can not the reviewer present an honest difference of opinion and not impugn the motives or deride the conclusions of one who happens not to agree with him? Why can not the reviewed author be less sensitive or less inflammable, and measurably profit thereby? Or, failing in either of these points, would not our over-worked editors be justified in throwing out manuscripts that are controversial until the parties concerned had reached some agreement (to disagree, perhaps)?

If authors would settle their disputes between themselves and give us in our journals either the benefit of their conclusions or an amicable statement of points of divergence, we would feel that the scientific fraternity was reaping the benefit of co-operation rather than the whirlwind of dissension. May we not get together outside

our journal covers and reserve the printed page for results or, at least, for such statement of difference in opinion as will display good sportsmanship? I appeal for professional courtesy among scientists.

In this connection it is a pleasure to acknowledge a letter from Dr. C. Hart Merriam in which he advises the use of the vernacular name "lodge-pole pine" instead of "tamarack pine" and of "Sierra Chickaree" instead of "Douglas Chickaree" as published in my "Notes from the Region of Lake Tahoe" (CONDOR, XXII, 1920, p. 78). I accept the suggestion as being in the interest of better use of the vernacular name, and extend my thanks to Dr. Merriam.

LOYE MILLER, *Southern Branch, University of California, December 15, 1920.*

#### MINUTES OF COOPER CLUB MEETINGS SOUTHERN DIVISION

DECEMBER.—Regular monthly meeting of the Cooper Ornithological Club (Southern Division) was held at the Museum of History, Science and Art, at 8:00 P. M., December 30, 1920. Members present: Mesdames Bicknell, Fargo, Law and Martin; Messrs. Appleton, Bishop, Brown, Chambers, Hanaford, King, Lamb, Law, Little, Miller, Nokes, Pierce, Rich, Robertson, Ross, Taylor, van Rossem, Wood and Wyman. Among the visitors were Mrs. Bishop, Mrs. Chapman and Miss Fargo. On motion by van Rossem, seconded by Lamb, Dr. Bishop's paper on birds of the Monterey Bay region was presented before business matters were taken up.

Following a short recess, minutes of the November meeting were read and approved, while those of the Northern Division for the same month were read by title only. Applicants whose names were previously presented were declared elected, on motion by Mr. Appleton that the Secretary cast a favoring vote. New presentations were: Dale T. Wood, 1470 E. Wilson Ave., Glendale, by Alfred Cookman; Mrs. C. H. Hall, 512 W. 30th St., Los Angeles, by Mrs. F. T. Bicknell; Dean Farnsworth, 1009 Manning St., Winfield, Kans., by Rev. P. B. Peabody; Elmer I. Applegate, Klamath Falls, Ore., by Mrs. F. M. Bailey; Howard W. Wright, 830 No. Orange Grove Ave., Pasadena, Calif., by A. J. van Rossem; W. Stanley Kitt, 129 So. 5th Ave., Tucson, Ariz., by Charles T. Vorhies; Richard Bramkamp, Banning, Calif., and Dr. F. D. West, Beaumont, Calif., both by M. French Gilman; John Beatty Hurley, 225 East E St., Yakima, Wash., by J. Hooper Bowles. The Northern Division sent names as follows: Mrs. Lewis Arnold, Lewis Ar-

nold, Mrs. Lydia Wilcox, Mrs. Flora Dudley, Geo. B. Culver, Ynez Mexia de Reygadas, Wm. Duncan Strong, Harold Hammond Cozens, Mildred Kellogg, Mrs. Charles Gilman Hyde.

The nominating committee reported as follows: For President, Donald R. Dickey; Vice-President, L. H. Miller; Secretary, L. E. Wyman. Dr. Miller withdrew in favor of Mr. A. B. Howell. On motion of Dr. Rich the report was accepted and the committee discharged. Nominations were closed on motion of Mr. Lamb, seconded by van Rossem.

On behalf of the business managers, Mr. Law offered a resolution relative to certain constitutional amendments, a copy of which was submitted to the members. His motion that this resolution be adopted was seconded by Dr. Nokes, to be voted upon at the January meeting.

Inspection of a series of shore-bird skins, and the usual round of informal discussion, completed the session. Adjourned.—L. E. WYMAN, *Secretary.*

JANUARY.—Regular meeting of the Southern Division of the Cooper Ornithological Club was held at 8 P. M., at the Museum of History, Science and Art, January 27, 1921. Vice-President Rich presided, with others in attendance as follows: Miss Beers; Mesdames Bicknell, Brownlee, Fargo and Hall; Messrs. Appleton, Barnes, Bishop, Brown, Chambers, Colburn, Howell, King, Lamb, Little, Nokes, Pierce, Selwyn Rich, Ross, van Rossem and Wyman. Fourteen visitors were present.

Minutes of the December meeting were read and approved, followed by reading of those of the Northern Division. Persons whose names were presented at that meeting were elected, on motion by Mr. Chambers, seconded by van Rossem, that the Secretary be instructed to cast a favoring ballot. New presentations were: Dr. A. G. Prill, Scio, Ore., by Stanley G. Jewett; Albert F. Ganier, 2507 Ashwood Ave., Nashville, Tenn., and Mrs. D. Barnard Bull, Route A, Box 158, San Jose, Calif., by W. Lee Chambers; Mrs. A. J. French, Carlton, Ore., and Russell Reid, Bismarck, No. Dakota, by F. M. Bailey.

A letter from the Secretary of the Pacific Division, American Association for the Advancement of Science, announcing Berkeley as the meeting place for 1921, August 4th to 6th as the date, was read by the Secretary. Election of officers for the ensuing year was then taken up. On motion of Mr. Appleton, seconded by Dr. Nokes, the rules



were suspended and the Secretary instructed to cast the unanimous vote of the club for Messrs. Dickey for President, Howell for Vice-President, and Wyman for Secretary. Motion carried and nominees declared elected. Consideration of other business matters was postponed on motion of Mr. Lamb until after the Secretary's paper on "Birds of the Thunder Mountain Trail."

Following a short recess the revised constitution presented at the December meeting was read and after long discussion was adopted by a vote of nine to three. Adjourned.—L. E. WYMAN, *Secretary*.

#### NORTHERN DIVISION

DECEMBER.—The Northern Division of the Cooper Ornithological Club met at the Museum of Vertebrate Zoology, December 16, at 8 P. M. President Wright presided and those in attendance were: Mesdames Allen, Bennet, Bridges, Grinnell, Law, Pringle, E. D. Roe, G. T. Roe, Thomson, and Wythe; Messrs. Bell, Bryant, Carriger, Cooper, Dixon, Emerson, Evermann, Grinnell, Lastreto, Law, Mailliard, McLean, Noack, Ritter, Storer, and Wright; Visitors: Dr. Bailey, Mrs. Evermann, Mrs. Reygadas, Miss Howitt, Miss Wythe, Mr. Martens, and Mr. Baker. The minutes of the November meeting were read and approved. Mrs. Lydia Wilcox, Mr. and Mrs. Lewis Arnold, Mrs. Chas. Gilman Hyde, and Mr. Geo. B. Culver were elected members of the Club. The seventeen names presented at the October meeting of the Southern Division were also approved. New proposals were: Mrs. Flora Dudley, Hotel Paisley, Geary near Mason, San Francisco, by Mrs. E. D. Roe; Mrs. Ynes Mexia de Reygadas, Room 401, Medical Bldg., Hyde and Bush, San Francisco, Wm. Duncan Strong, 2522 Ridge Road, Berkeley, Miss Mildred Kellogg, 2232 Piedmont Ave., Berkeley, and Mr. Harold Hammond Cozens, 3071 Bateman St., Berkeley, by Dr. H. C. Bryant.

Nominations for officers for the year 1921 resulted in the presentation of the following names to be voted on at the January meeting: For President, Mr. Curtis Wright; for Vice-President, Mr. H. S. Swarth; for Secretary, Mrs. J. T. Allen. All nominations were promptly closed.

Business completed, the club was privileged to listen to a paper by Prof. Wm. E. Ritter on "The Acorn-storing Habits of the California Woodpecker". The speaker deplored the existence of a great gap between laboratory science and the field observations

of naturalists, and urged more complete tabulation of data obtained by careful observation of animals in the wild. Adjourned.—AMELIA S. ALLEN, *Secretary*.

JANUARY.—The Northern Division of the Cooper Ornithological Club met at the Museum of Vertebrate Zoology, January 26, at 8 P. M. President Wright presided and those in attendance were: Mesdames Allen, Blake, Burk, Flinn, Griffin, Grinnell, Law, McLellan, Reygadas, Rush, and Thomson; Messrs. Cox, Dixon, Emerson, Evermann, Grinnell, Lastreto, Law, Mailliard, McKibben, McLean, Miller, Storer, Swarth, and Wright. Visitors: Mrs. Calhoun, Mrs. Del Port, Mrs. Dixon, Mrs. Evermann, Mrs. Thomson, and Mr. Jencks. The minutes of the December meeting were read and approved. Mrs. Flora Dudley, Mrs. Reygadas, Mr. Strong, Miss Kellogg, and Mr. Cozens were elected members of the Club. New proposals were: Miss Una Boyle, 132 Laurel Place, San Rafael, by T. I. Storer; Mrs. Margaret Morse Nice, Norman, Oklahoma, by J. R. Pemberton; Mr. Reginald C. Robbins, Hot Springs Ave., Santa Barbara, by J. Grinnell; Mr. Carroll McGettigan, 2644 Filbert St., San Francisco, by Dr. Evermann; George H. Kellogg, 2526 Piedmont Ave., Berkeley.

A letter asking for two representatives on the Affiliations Committee of the Pacific Division of the American Association for the Advancement of Science was read. The president, instructed by vote of the Club, appointed Mr. Joseph Mailliard and Mrs. A. S. Allen to that committee. On motion of Dr. Grinnell, seconded by Mr. Mailliard, resolutions forwarded by Dr. Bryant relative to the taking of specimens, were referred to a committee appointed by the President (later announced to consist of Dr. Grinnell, Mr. Storer, and Mr. Swarth), said committee to report at the February meeting. Mr. Law then outlined plans for proposed changes in the constitution providing for more definite organization of the Club under a Board of Governors.

Mr. Lastreto presided during the election of officers, which resulted as follows: President, Mr. Curtis Wright; Vice-President, Mr. H. S. Swarth; Secretary, Mrs. J. T. Allen.

Business completed, Dr. T. T. Waterman outlined some of the Indian myths relating to the Raven, the Thunder Bird, the Coyote, and other birds and animals. After discussion and exchange of observations the Club adjourned.—AMELIA S. ALLEN, *Secretary*.

*For Sale, Exchange and Want Column.*—Any Cooper Club member is entitled to one advertising notice in each issue free. Notices of over ten lines will be charged for at the rate of ten cents per line. For this department, address W. LEE CHAMBERS, *Eagle Rock, Los Angeles County, California.*

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Two young men, now in college, are anxious to obtain positions on a collecting crew during the next summer vacation. Dates: June 5 to September 5. Anyone interested please write GORDON ALEXANDER, *Box 191, Fayette, Mo.*

WANTED for cash: Bendire's "Life Histories", vol. II.—ROSWELL S. WHEELER, *166 Athol Ave., Oakland, Calif.*

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THE  
**CONDOR**

A Magazine of Western  
Ornithology

Volume XXIII

May-June, 1921

Number 3



W.K.F.

COOPER ORNITHOLOGICAL CLUB

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# THE CONDOR

A Magazine of Western Ornithology  
Published Bi-Monthly by the Cooper Ornithological Club

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Entered as second-class matter November 29, 1919, at the post-office at Berkeley, California, under Act of Congress of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized January 5, 1921.

Issued from the Office of THE CONDOR, Museum of Vertebrate Zoology, Berkeley, California

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## SUBSCRIPTION RATES

Two Dollars per Year in the United States, payable in advance.

Forty Cents the single copy.

Two Dollars and Twenty-five Cents per Year in all other countries in the International Postal Union.

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Two Dollars per year for members residing in the United States.

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Manuscripts for publication, and Books and Papers for Review, should be sent to the Editor, J. GRINNELL, Museum of Vertebrate Zoology, University of California, Berkeley, California.

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Issued June 3, 1921

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# THE CONDOR

A Bi-Monthly Magazine of  
Western Ornithology



Volume XXIII

May-June, 1921

Number 3

[Issued June 3, 1921]

## NOTES ON THE NESTING OF THE YOSEMITE FOX SPARROW, CALLIOPE HUMMINGBIRD AND WESTERN WOOD PEWEE AT LAKE TAHOE, CALIFORNIA

By JOHN W. MAILLIARD

WITH ONE PHOTO

I N company with my daughter-in-law, Mrs. John W. Mailliard, Jr., whose aptitude for observation and persevering interest in the work enabled me to secure many of my notes, daily field trips were undertaken at Lake Tahoe in 1920 from May 29 until July 13, the area thus covered being that portion of the lake front extending from Blackwood Creek on the south to the meadows of Burton Creek on the north, and the immediate back country thereof. Our first desire was to observe the nesting habits of the Yosemite Fox Sparrow, which was much in evidence in that neighborhood. Partial success in this soon led us to make similar observations upon the ever-present, teasing little Calliope Hummingbird, and while at first these were unavailing, success finally rewarded our fast ebbing patience.

### YOSEMITE FOX SPARROW

This bird (*Passerella iliaca mariposae*), as already intimated, was found in great abundance in all suitable localities. The expression "suitable" is to be taken in a very broad sense in this instance, as the bird was by no means confined to the ceanothus association, but was also quite abundant in willow and aspen, at least in the Burton Creek meadows. Apparently the ground is as attractive to this species for nesting purposes as are more elevated sites, and in either case no general rule seems tenable. Of the fourteen nests which came under our observation six were on the ground, but in such variety of detail that short descriptions of them seem excusable.

Two of the nests of the Yosemite Fox Sparrow were placed at the foot of fairly well isolated Douglas fir seedlings two and three feet high, respectively, one of which was within stone's throw of occupied human habitations on the one side and of a much used highway on the other. Another nest was well concealed under an almost impenetrable thicket of chinquapin and some feet from its edge. One was under the leaning main limb and near the center of a spreading golden-cup oak, near an unoccupied bungalow. Another was under a small, isolated ceanothus bush, but a few feet from a large boathouse in which work was being accomplished almost daily, while still another was in an aspen grove, under a piece of lodged bark.

Of the eight nests built above the ground three were placed in ceanothus or buckthorn bushes at heights ranging from eight inches to one and a half feet, the nesting site varying from the edge of a thicket well into the interior. One nest was placed on a mass of fallen and drooping dead willow limbs, about two feet and a half above the ground, and was soon well hidden by the rapid growth of the wild gooseberries interspersed throughout the accumulation of dead branches. Another was situated two feet from the ground in the fork formed by a two-inch shoot and the main trunk of a large willow, the nest being placed against the latter. Yet another was on a mass of dead branches and debris under a clump of willows, and was also two feet from the ground. A nest was found in a gooseberry tangle under a willow, about four and a half feet from the ground, while a further variation was found in the last one of this species for the season, discovered on July 5, in course of construction. This was upon the dead branches of an aspen, over, and three feet above, a small running stream, eighteen inches out from, and twelve inches above, the level of the stream bank. While quite open above, it was well shaded by gooseberry bushes.

Whatever the situation of the nest, all seemed to follow a well established form of construction, variations being practically limited to the amount and kind of material used in the wall of the structure. In the case of nests in elevated positions this material consisted of varying quantities of dead twigs, often of remarkable length considering the size of the builder. In one instance a twig of fourteen inches, and in another of twelve and a half inches, was used, with diameters at the base of over a quarter of an inch. Nests on the ground were often banked up with vegetable debris in place of twigs.

In all instances the nest proper was composed of combinations of shreds of old bark, small dead twigs, old chips and small chunks of wood and dead leaves. All of this material, more or less decayed and very light in weight, was used in varying proportions in the different nests, sometimes one or two of these constituents being omitted. The wall of one nest contained several chips of wood, the largest of which was five and a half inches long by one and a quarter wide, and very thin, possibly a piece of berry basket. The lining of the nests was of finely shredded bark, dead rootlets, old dry grasses and sometimes horsehair.

Extreme measurements of nests, in inches, are as follows:

	Maximum	Minimum
Diameter	outside 14	6
	inside 3	2½
Depth	outside 5½	3
	inside 1¾	1

Owing to the great shyness of this species but few opportunities for observing the actual nest building presented themselves. In one instance a bird was watched as it dragged a twig, at least eight inches in length, along the ground and up through and over the mass of dead branches and debris upon which, at a height of two feet from the ground, the nest was placed. Previously, the same bird had been seen carrying a small twig to its nest by direct flight. In another instance, where a nest was four feet and a half from the ground in a gooseberry tangle, the bird picked up twigs but a few yards from the nesting site and carried them to it by direct flight. These twigs varied greatly in length, the longest being estimated at ten inches, and several were dropped on the way. In a heroic effort to maintain a proper balance with a coveted twig while striving to reach its destination, the bird's body was almost perpendicular, its attitude and rapid



wing movement reminding one of a hummingbird at a long-necked flower.

The continual song of the male, from his favorite perch near the nest site, and the fact that the sitting bird, while feeding nearby, is not replaced by its mate, leads to the belief that the female alone attends to the duties of nest construction and incubation. Sometimes, while near the nest, the male breaks into song, not only when standing on the ground but when he is scratching or hopping about in the brush as well.

In spite of the startling amount of general destruction of eggs, young and nests of birds, presumably by chipmunks, predatory birds, snakes, etc., prevalent in the Lake Tahoe region, no nests of this fox sparrow were molested before the

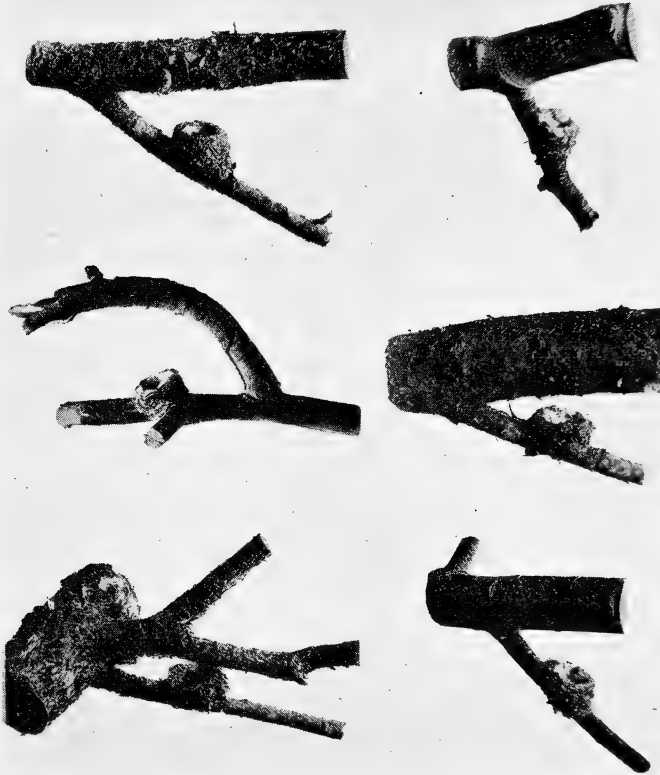


Fig. 15. NESTS OF CALLIOPE HUMMINGBIRD SHOWING, IN EACH CASE, PROTECTING LIMB OVERHEAD.

eggs were hatched. This was probably due to the facts (established by careful observation) that incubation commences with the laying of the first egg, and that the sitting bird never goes far from the nest.

#### CALLIOPE HUMMINGBIRD

While this species (*Stellula calliope*) was present in all the suitable localities we visited, no evidence of its nesting was observed, in spite of most painstaking work, until June 12, when three nests, all containing young, were located in a small belt of timber in the meadows of Burton Creek and not far distant from the shore of Lake Tahoe. As eight of the nine nests which ultimately came

under our observation were in this same belt, a bit of description thereof seems advisable. Beginning at the mouth of a small stream this belt, perhaps one hundred yards in width, extended along both sides of the stream for some three hundred yards, to where the latter made a sharp turn into an open portion of the meadows in which only willows grew. Not far distant the forest of the mountain slopes extended to the meadow to within a few rods of the above described timber belt, and in one of the nearest trees of this forest the ninth nest was discovered.

Such close sitters were the birds that all the nests were discovered purely by sight. Two of them were looked for because of the birds' actions toward other birds in the vicinity, the first nest found having given us an intimation of where to look for others.

The favorite nesting site is very clearly shown in the accompanying illustration, all the nests having been collected (in most cases after the young had left them) for photographic purposes. Whether in a tamarack (lodge-pole pine) or in an aspen, the only two kinds of trees in which nests were found, every nest discovered by us was upon an under limb near where it forked from a larger one above, the latter giving good protection, not only from the sun, snow and rain, but, as well, from the too inquisitive eyes of would-be marauders. In elevation from the ground the nests varied from fourteen to thirty feet, and in distance from the main tree trunk, from four to ten feet.

It was noticed that when females were disturbed from their nests they showed much more apprehension for their eggs than, later on, for their young. Nevertheless, they were much concerned over the latter also and would resume brooding even when a person remained within a foot or so of the nest. In one instance, when a nest containing eggs was being collected, a rope was passed over a higher branch for the purpose of balancing the long, protecting limb, just below which the nest was placed, and to assist in lowering it to the ground. The bird remained upon the nest during the proceeding until it was actually being lowered. At one stage the limb turned until the nest was at an angle of about forty-five degrees, but by fluttering her wings the bird succeeded in maintaining her position thereon. Evidently ornamentation of the nest begins with the laying of eggs, as a female was observed busily engaged in this occupation, although the eggs were perfectly fresh.

#### WESTERN WOOD PEWEE

Unusual opportunities were offered by this very abundant species (*Myiochanes richardsoni richardsoni*) for the study of its nest-building activities, which, in several instances, were conducted under most favorable conditions for the observer. One female gathered its building material by pecking small bits of bark from the branches of a dead willow, which was but a few yards from the large yellow pine in which the nest was placed. At times small bits of this material could be distinguished in the bill of the busy bird, while at other times nothing was discerned, the presence of such only being evidenced by the operations of the bird upon its return to the nest. Meantime the male perched in the near vicinity, or darted after its prey, sometimes perching in, or darting from, the very tree in which the nest was being constructed.

Another pair built three nests in rapid succession, each of which was watched daily, often many times in a day. Number one was discovered on June 4 at a very early stage, a mere lump of material saddled upon a small dead limb of an aspen and about twelve feet from the ground. A heavy storm, on the night of

June 15, washed it from its moorings and it was found the following morning at the foot of the tree, waterlogged. No egg shells were in evidence and I am reasonably sure that it contained no eggs, so at least fourteen days were consumed in its construction. Nothing daunted, the bird started nest number two on June 18, in another aspen only a few rods from the previous site, but this time twenty feet from the ground. The first egg was laid June 26, and another on each of the two days following. On the 29th the nest, with its three eggs, was collected. Only eight days were thus required for its construction. Again showing its perseverance this bird started number three on July 2, once more in an aspen, but much nearer site number one than was the last. This time it was fifteen feet from the ground. The first egg was laid on July 9, seven days having been required for building the nest.

Although frequently watched at short range, with and without field glasses, at no time was any building material visible in this bird's bill, nor was she ever discovered in the act of gathering any. At no time was the male in evidence. Occasionally others of this species would appear, only to be promptly driven off by the nest builder. Possibly a lone bird in sole possession of a beat on the lake front a few rods distant may have been its mate.

Building operations seemed to consist solely in a constant pecking-weaving process, and the shaping of the nest was accomplished by the bird twisting its body while in the nest, and by arching its neck so that its throat was over the rim and against the side of the nest. The head was then moved back and forth along the rim much as one sharpens a razor on a strop. With a similar effect the tail was often thrown down and compressed against the outside of the nest, but no lateral motion could ever be discerned.

While numerous other nests were found, none of them was so located as to permit of such intimate study as the above, so in this connection I will only mention that the Douglas fir and red cedar, as well as the aspen and yellow pine already mentioned, were acceptable to this interesting little flycatcher for house-keeping purposes.

*San Francisco, California, February 24, 1921.*

## THE PROBABLE STATUS OF THE PACIFIC COAST SKUAS

By A. C. BENT

WHILE working out the distribution of *Catharacta skua* Brünnich, I was somewhat puzzled to know what to do with the Pacific Coast records of this species, for it hardly seemed reasonable to suppose that the Great Skua of the northern Atlantic Ocean would wander so far away from its normal range. My suspicions were strengthened by a prophetic, and perhaps intuitive, statement by Ridgway (*Birds of North and Middle America*, part 8, 1919, p. 678) that this species is "recorded from Aleutian Islands and from Monterey Bay, California, but probably erroneously, at least as far as correct identification is concerned, the Monterey specimens, at least, being more likely *M. chilensis*."

After corresponding with Mr. Harry S. Swarth, in an endeavor to help him to establish the identification of the two Monterey specimens in the University of California collection, he finally decided to send me these two birds and very kindly did so. But when I saw them, I was more puzzled than ever, for they were entirely unlike any specimen of *Catharacta* I had ever seen. The chief characters of these two birds are small size and uniform dark colors, without any signs of mottling or streaking. They are smaller than any of the skuas except *chilensis* and *maccormicki*, the former of which is quite rufous in color and the latter very light colored. In the Monterey birds the wings and tail are "sooty black"; the head, neck and back are "hair brown" to "chaetura black"; the under parts are uniform "hair brown"; and the under tail-coverts are "chaetura drab" (Ridgway's *Color Standards and Color Nomenclature*, 1912). I thought, at first, that they represented an undescribed species and I am not sure now that they do not. I determined to investigate the matter thoroughly and now propose to give the readers of *THE CONDOR* the results of my investigations and let them come to their own conclusions.

In the Museum of Comparative Zoology, at Cambridge, Massachusetts, I compared them with the small series there available of *Catharacta skua* Brünnich, *C. antarctica* (Lesson) and *C. chilensis* (Bonaparte). The Monterey birds are entirely unlike any of these; but there is one bird in the Museum (Bangs collection, no. 13927), taken in Sagami Sea, Japan, August 23, 1903, which closely resembles them. Mr. Bangs had called my attention to this bird a long time ago and showed me some correspondence he had had with Dr. Richmond about it: but the bird was in such badly worn and faded plumage that it seemed hardly safe to base any conclusion on it. It probably belongs, however, to the same species as the Monterey birds.

After reading Mathews' (*The Birds of Australia*, p. 485) statement that immature specimens of *Catharacta lonnbergi* Mathews are "uniform brownish black on the upper surface: the lower uniform brownish gray", I thought that I had found the solution of the problem: for these colors seemed to match the birds in question exactly. So I appealed to Dr. Richmond and he very kindly sent me the entire series of this species in the National Museum collection, three birds from Kerguelen Island, one bird from Tasmania and one bird from the Seychelles Islands. But I was thrown off the track again, when I examined these birds, for they all proved to be very much larger than the Monterey birds:

in fact, they are the largest of all the species of *Catharacta*. Moreover, these birds, which were perhaps all adults, were much more mottled, or streaked, with lighter colors than the Monterey birds.

There still remained one species, *Catharacta maccormicki* Saunders, with which I had made no comparisons, and I noticed in reading Dr. E. A. Wilson's (National Antarctic Expedition, vol. 2, p. 75) account of this species, that his measurements agree very closely with those of the birds from Monterey. He also says that the young birds of *C. maccormicki* are dark colored and that "even the oldest adults are dark when freshly molted." As I could not locate any specimens of *maccormicki* in this country, I wrote to Dr. Hartert and he very kindly sent me, from the British Museum, their only specimen of this species in immature plumage, a very young but fully grown and fully fledged bird, with some of the natal down still clinging to the tips of the feathers. But this also proved to be entirely different from the Monterey birds in color; it was a uniform "neutral gray" or "light mouse gray" (Ridgway), both above and below; the top of the head and back were no darker than the under parts; the wings and tail were darker, but not so dark as the birds in question.

This left me still more in the dark than ever, as I had compared the puzzling birds with every known species of *Catharacta*. It was not until I went to New York and studied the extensive series of skuas in the American Museum of Natural History, mainly in the Brewster-Sanford collection, that I began to get any light on the subject. In their magnificent series of thirty-eight specimens of Chilean Skua (*Catharacta chilensis*) I was surprised to find four which matched the Monterey birds almost exactly. In talking the matter over with Dr. Robert Cushman Murphy, who is familiar with both *Catharacta chilensis* and *C. antarctica* in life, he told me that he had noted these dark-colored birds and had at first thought of describing them as a distinct species, but that he had since come to the conclusion that they were the young of *chilensis*. In support of this theory he said that these dark-colored birds were quite common on the coasts of Chile and Peru and that they associated freely with the ordinary rufous birds of this species. Also, he had actually proven by studies in the field that the young of *antarctica*, the resident form of South Georgia, are uniformly dark-colored, having watched a young bird develop from the downy stage. I have already shown above that this is also true of *lonnbergi* and *maccormicki*.

Up to this time I had ruled out *chilensis* on account of its color, which is decidedly rufous in all specimens I had seen, though agreeing in size with the Monterey birds. But after examining this series and after talking with Dr. Murphy, I was forced to the conclusion that the birds in question are probably referable to *Catharacta chilensis* (Bonaparte). I am not, however, quite prepared to accept Dr. Murphy's theory that they are immature birds and am more inclined to think that they represent a dark phase of that species.

In the Catalogue of Birds in the British Museum (vol. 25, p. 315), under *Megalestris chilensis*, I read that "in less mature birds the chestnut color is neither so pronounced nor so extensive, but is always a strong characteristic of the species." Furthermore, both of the Monterey birds are in fresh plumage and have recently molted; one of them (Mus. Vert. Zool., no. 17758) had not quite completed its molt when it was collected on August 4, 1910, for the outer primary in each wing is old and worn. As the first molt of the primaries in birds of this group usually occurs when the bird is from 14 to 16 months old, it may safely be inferred that these birds are more than one year old, at least, and

perhaps much older. At this age juvenal characters should have, at least partially, disappeared. I am reluctant to adopt the color phase theory unless it can be proven; but it must be borne in mind that at least two other species of this family are known to have very distinct color phases.

On the strength of all the above evidence, it seems fair to assume, for the present and until further evidence is produced, that all of the specimens of *Catharacta* taken north of the Equator in the Pacific Ocean are referable to *C. chilensis* (Bonaparte). These specimens, so far as known to the writer are: One in the American Museum of Natural History, New York (no. 46093), taken off Monterey many years ago, before 1853, by or for Nicholas Pike; one in the Museum of Comparative Zoology in Cambridge (Bangs coll. 13927), taken in Sagami Sea, Japan, August 23, 1903; one in the California Academy of Sciences, San Francisco (no. 10920) and two in the Museum of Vertebrate Zoology, Berkeley (nos. 17758, 17759), all three taken by Rollo H. Beck, in Monterey Bay, on August 7, 1907, August 4 and September 21, 1910, respectively; and three taken by Stanton Warburton, Jr., off the coasts of Washington and Vancouver Island, on June 28 and 30, 1917. Mr. Joseph Mailliard has very kindly sent me a full and accurate description of the Academy bird, and I understand that Mr. Warburton's birds were identified by Mr. Harry S. Swarth as of the same species as those in the Museum of Vertebrate Zoology. Apparently they are all of the same species. This materially extends the range of the Chilean Skua, *Catharacta chilensis* (Bonaparte), and adds this species to the North American list.

*Taunton, Massachusetts, March 18, 1921.*

## NESTING OF THE STEPHENS FOX SPARROW

By WRIGHT M. PIERCE

WITH THREE PHOTOS BY THE AUTHOR

THESE seem to be no published records of the nesting of the Stephens Fox Sparrow (*Passerella iliaca stephensi*), nor a description of the eggs. While sets of eggs of this bird may have been collected by others, I, myself, had not enjoyed that experience, and I was anxious to find a nest.

The past few seasons I, with different companions, have been making regular collecting trips to Big Bear Lake, San Bernardino Mountains, southern California, one of the principal homes of the Stephens Fox Sparrow; but search for sets had always been without results prior to 1919. We had spent much time scouring through the patches of mountain misery (*Ceanothus*) which grows quite thick, from two to four feet high, and is covered with numerous thorns; and also through the chinquapin, a scraggy, wiry bush which grows to about the same height and is very difficult to penetrate. While the birds themselves were quite abundant in favored localities, such as the brush-covered canyons and little flats on the hills about the lake, the nearest we came to finding a nest was an encounter with young just out and not yet able to fly. Naturally we arrived at the conclusion, wrongly as we later discovered, that the birds must nest only on

the ground. We also surmised that probably they were close sitters or else left the nest long before the collector approached near, or that perhaps they nested much earlier in the spring than the time when we were able to go to their nesting grounds.

The spring of 1919, two fellow Club members, Gordon Nicholson, of Upland, and S. Rich, of Claremont, accompanied me to Big Bear on May 30, wishing, but I must say not very hopefully, that we would find the nest of the Stephens Fox Sparrow. Anyway we would almost certainly find such nests as the Wright Flycatcher and Green-tailed Towhee in our hunting, so that our work would not be without some results.

On the afternoon of May 31 we started to prospect carefully through a likely looking patch of mountain misery, oftentimes called buckthorn, near the lake shore; and to prospect means to examine every bush carefully. Stephens Fox Sparrows and Green-tailed Towhees were singing, Wright Flycatchers twitter-



Fig. 16. STEPHENS FOX SPARROW APPROACHING NEST; BIG BEAR LAKE, SAN BERNARDINO MOUNTAINS.

ing, Calliope Hummingbirds darting here and there, with an occasional Ashy Kinglet and many Audubon Warblers busy in the pines above us. We had not gone far until we kicked out a rather young fox sparrow from the brush, and then another. The parents were near at hand and played the broken-wing trick to perfection in their attempts to coax us away, all the while uttering their metallic "chip". A little farther on, while I was examining a nest of the Wright Flycatcher, Nicholson shouted, "I have a Stephens on a nest"; so to him goes the credit of our first nest. This was three feet up in a crotch of a buckthorn bush. One of the parents was sitting; in fact the bird sat so close that she (it may have been the male) did not flush until I was about a foot from her. The nest contained one fresh egg, which we left, hoping for a complete set. Luck was with us and the nest with three eggs was collected June 2. This nest was poorly hidden, being comparatively easy to see from the edge of the brush. Since



all the nests that we found are so similar, a general description covering them all will be given later on in this article.

The eggs of this first set measure in millimeters as follows: 21.5x16.5, 21.6x16.5, and 21.x16.5. These eggs are very nearly equal ended, with a pale glaucous blue ground color, and they are boldly marked. One is rather heavily spotted and blotched with cameo brown and vinaceous russet, the darker spots being chocolate color. There are distinct under tints of plumbago gray, making it one of the most beautiful eggs of this species that I have ever seen. The markings are about evenly distributed over the whole egg. The second egg is spotted and only slightly blotched or flecked with cameo brown and vinaceous russet. The



Fig. 17. STEPHENS FOX SPARROW ON NEST; BIG BEAR LAKE, SAN BERNARDINO MOUNTAINS.

darker markings are chocolate as in the other egg. There are a very few under tints of plumbago gray. This egg is heavier marked on the large end. The other egg is uniformly spotted with cameo brown and vinaceous russet; a few of the spots are chocolate. On this egg there are also fewer of the undertints of plumbago gray. These eggs are slightly glossy. Color terms here used are taken from Ridgway's *Color Standards* by matching.

The following day, June 1, while working my way up a little canyon, the sides of which were thickly covered with low buckthorn, about a mile from the lake shore, I found set number two. This nest was in a low buckthorn bush, only about six inches from the ground, and was discovered by seeing the bird sitting

on the nest. This bird also sat closely, not flushing until I nearly touched her. It then hopped off through the brush, uttering at times the usual Fox Sparrow chirp. This nest also held three eggs, with a trace of incubation. This set was sent to Mr. R. C. Harlow of State College, Pennsylvania, who sends me the following description: "In size they run .95x.69, .92x.66, .97x.69—measurements in inches. In color they are pale greenish white, the largest egg being almost a faint greenish blue, (chiefly) flecked, dotted and blotched with reddish brown and burnt umber, the markings tending to be heavier around the larger end, where they almost obscure the ground color. In one egg the markings at the larger end are practically solid."

A third nest, containing two infertile eggs and one young, was found June 2 by S. Rich. This nest was one and one-half feet up in a buckthorn bush about one-half mile from the lake shore, and was similar in construction to the others. However, the eggs are quite different in that they are perceptibly smaller than

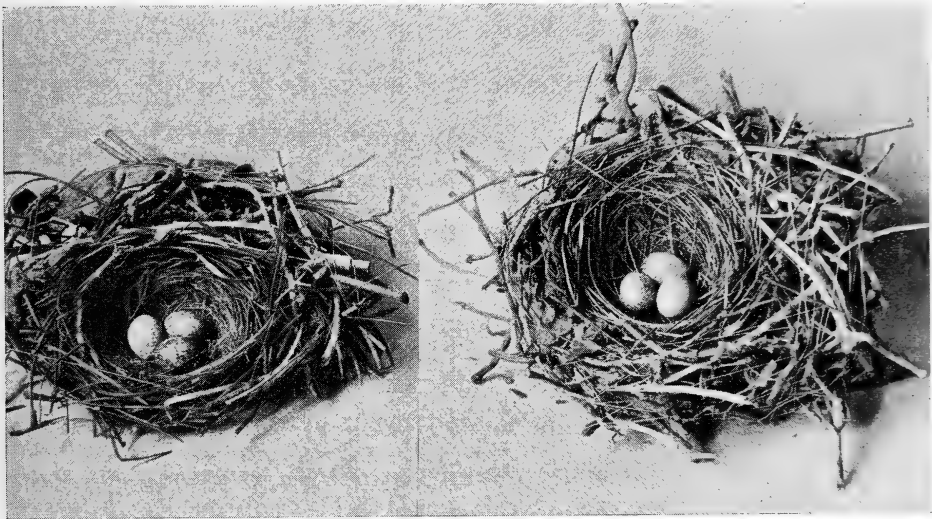


Fig. 18. NESTS AND EGGS OF STEPHENS FOX SPARROW; IN THE COLLECTION OF WRIGHT M. PIERCE.

the average. These eggs are now in the collection of Mr. K. L. Skinner, of Weybridge, England, who has very kindly sent me the following description of them: "The two eggs are both very blunt with very little small end. One egg is thickly marked, the other very lightly by comparison. In the light one the ground color is very pale greenish and both eggs when held to the light exhibit a greenish tint. In the light one the blotches are drawn together at the larger end, not in the form of a zone, but in an irregular cap at the extremity. I can only describe the markings as much like the commonest type of song sparrow but they are a little smaller and more distinct. Both eggs carry a good gloss. Light egg measures 20.x16.5 mm., the other 20.25x17. mm."

The season of 1920 we went after sets of the Stephens Fox Sparrow again. Our first trip was in the San Gabriel Mountains, back of Mount Baldy in Swart-out Canyon. Here, although the birds were only fairly common, we had unusually good luck, finding three nests on May 31. Two were on the ground under buckthorn, and another about one foot up, also in buckthorn. Two of the nests

contained three eggs each, and the other but two. Gordon Nicholson, Luther Little and I had equally good success in finding these sets.

The first set of three measures in millimeters: 22.x17.5, 23.x17.5, and 23.x18. The eggs of this set are rather blunt and equal ended. The ground color is dull glaucous blue, one rather heavily clouded with chestnut, one less so, and the third one still less; each egg more heavily marked on the larger end. Each egg is only slightly glossy. The second set of three measures: 22.x17.5, 21.x17., 22.5x18. The ground color in these eggs is also dull glaucous blue. Two eggs are heavily clouded with russet all over, only slightly more so on larger end; the other egg is evenly clouded but to a lesser degree. These eggs are also rather blunt and equal ended, with only a slight gloss. The two eggs of the third set are of the long type, being much more pointed on the little end than are any eggs of the other sets. Their ground color is pale dull glaucous blue, uniformly marked with fine spots and flecks of closely blended vinaceous russet and light purplish gray, so as to almost obscure the ground tint. They measure 22.5x15., 23.x15.5. These eggs exhibit no gloss. The birds of each of these three nests sat very close, and the two nests that were on the ground were extremely difficult to locate.

A week at Big Bear later in the season gave us one nest, also with three eggs. This was the hardest nest to locate, I believe, that I ever went after, as it was on the ground under a tangle of buckthorn. Even after the bird flushed right under my feet, I did not find the nest until I had carefully hunted for about thirty minutes, although it was in a comparatively small patch of buckthorn. These eggs were fresh and were found June 6. They measure: 23.5x18., 23.5x17.5, and 21.5x17.5. In color they are pale dull glaucous blue, marbled all over with chestnut. The markings are almost clouded on the larger end of two of them, while the third is much less heavily marked. These eggs are also blunt and nearly equal ended, and have a very slight gloss.

The only other nest that we found with eggs, and these on the point of hatching, was also at Big Bear. This nest was in plain view; in fact I saw it when over thirty yards away. It was in an opening in the center of a broken bush of buckthorn on a side-hill. This bird was very obliging and it was here that I obtained the photographs that illustrate this article. Possibly her unusual tameness was due to the heavy incubation of the eggs.

The nests are all very similar, so that one description will do for all we found. In size they average, outside depth, 4.5 inches; inside depth, 1.75; outside diameter, 6; inside, 3. Nests are composed of coarse sticks and pine needles, with some fine twigs and weed bark, lined with grass, weed bark, and, at times, mammal fur. The nests on the ground were usually less well made, with more pine needles and leaves, rather than coarse sticks.

To sum up, it will be noted that the eggs we found, with the exception of one set, show only slight variation in size and shape. They are somewhat similar in markings. However, I have seen enough sets to say that a large series would undoubtedly show considerable variation in coloration, but I do not think that there would be much variation in general shape and ground color. The birds nest, so far as we have found, either on the ground or up in buckthorn bushes. I believe they build more often on the ground, where the nests are very hard to locate, especially, if they are placed under a thick mat of tangled buckthorn. At times they seem to choose the most open sort of location. They just seem to be where they are! My experience indicates that the birds are very close sitters, and three seems to be the usual clutch of eggs.

I wish here to thank Mr. K. L. Skinner for his kindness in sending me a description of the set of eggs in his collection, Mr. R. C. Harlow, who has kindly helped me in the same way, and Mr. A. O. Treganza for the loan of specimens.

*Claremont, California, February 7, 1921.*

# WEIGHTS AND PLUMAGE OF DUCKS IN THE RIO GRANDE VALLEY

By ALDO LEOPOLD

SINCE 1917 I have recorded the weights of about 300 ducks of fifteen species killed during the open season in the Rio Grande Valley between Socorro and Albuquerque, New Mexico. These weights, all plotted as colored points (one color representing each species) on coördinates of time in weeks and weight in pounds, respectively, give an interesting one-page graphic record of seasonal weight changes, maximum and minimum weights, comparative weights of species, seasonal abundance of species, and comparative abundance of species. It is impracticable to publish the colored graph, but the following data obtained from the graph, and questions and conclusions suggested by it, may be of interest.<sup>1</sup>

TABLE OF WEIGHTS IN POUNDS

Species	No.	Maximum		Minimum	
		Extreme	General	Extreme <sup>2</sup>	General
Mallard .....	101	3.30	3.00	1.75	2.00
Black Mallard .....	12	2.80	.....	2.20	.....
Pintail .....	33	2.37	2.10	1.30	1.50
Widgeon .....	33	2.63(?)	1.75	1.15	1.30
Gadwall .....	9	2.00	1.90	1.13	.....
Green-wing Teal .....	42	.82	.....	.50	.....
Blue-wing Teal .....	13	.90	.....	.56	.....
Spoonbill .....	37	1.69	1.50	.95	1.00
Canvas-back .....	7	2.63	.....	1.90	.....
Redhead .....	3	2.05	.....	1.50	.....
Bluebill (both sp.).....	4	1.50	.....	1.13	.....
Bufflehead .....	4	1.00	.....	.75	.....
Ruddy Duck .....	4	1.13	.....	.90	.....

The graph shows that Mallards attain their greatest weight in early November and decline slightly but steadily during December and January. Pintails stay about stationary, while Gadwalls and especially Widgeons increase steadily throughout the season. I know of nothing in their respective food habits to account for this. It suggests the possibility that weight may increase with maturity of plumage, more or less independently of food supply and food habits, it being a manifest fact, known to every hunter, that Mallards in this region attain nearly full maturity of plumage in November, while the other three do not show full feather until the middle of the winter. Spoonbills and Teals seem to decrease in

<sup>1</sup>Some preliminary "Notes on the Weights and Plumage of Ducks in New Mexico" were published in the Condor, XXI, May, 1919, pp. 128-129.

<sup>2</sup>These extreme minimum weights should be accepted with reservations because of the possibility of the figures containing crippled birds. No cripples were knowingly included, but occasionally even an active and apparently healthy bird has sustained wounds which may have affected its weight.

weight after November, but the number of late birds weighed is too small to be reliable.

In my previous notes I called attention to the varying weights and plumages of Mallards brought down by successive storms, and ascribed the flights of light, immature birds, which often follow heavy mature birds, to late northerly hatchings and long travel. Subsequent observations show no evidence to controvert this as to Mallards. But I now suspect that various breeding grounds, regardless of latitude, produce ducks of widely varying weights and plumages. Albuquerque Canvas-backs and Red-heads, for instance, weigh right around two pounds throughout the open season; and both species, though fat, nearly always show a very dull color and peculiarly frazzled plumage. Reliable hunters inform me, however, that the Canvas-backs of Lake Burford, in northern New Mexico, even on the opening day (October 16), are always big, heavy, bright-colored birds weighing up to four pounds. I doubt the four pounds, but everybody seems to agree that they are bigger and heavier in October than the ones shot at Albuquerque at any season. I have also heard sportsmen from the northern Rocky Mountain states talk about "big and little cans". I conclude that Lake Burford and Albuquerque are on different migration routes and draw their Canvas-backs from different breeding grounds producing differently developed birds.

The theory that weights vary with breeding grounds is corroborated by the small range of weight exhibited by Black Mallards (species not yet agreed upon by taxonomists), most of which are probably raised here in the Southwest, as compared with the great range of weight exhibited by ordinary Mallards, which are probably drawn from many breeding grounds extending from here to the far north. The graph shows the average weights of the two species to be about the same, but the spread of the dots for the latter species is twice that of the first.

The graph shows the maximum abundance of Pintails to be in October and January, with very few in November and December. These January Pintails are return flights during the January thaws, and during 1920 at least these return birds were nearly all full plumaged males. Every year males preponderate in these return Pintails. The graph shows that Blue-wing Teal are all gone by November 1, but a few Green-wings winter. Spoonbills mostly leave by December 15. Gadwalls show some tendency to be more abundant in October and January than in November. Mallards, of course, stay, but are least abundant in December.

A preliminary table showing relative abundance of species, based on two years' kill (1917 and 1918) has already been published<sup>3</sup>. The same method, applied to four years kill, 1917-1920, gives the following corrected table: Mallard 30 percent; Green-wing Teal, 15; Pintail, 12; Baldpate, 11; Spoonbill, 10; Mergansers, 5; Black Mallard (sp.?), 4; Blue-wing Teal, 4; Gadwall, 3; Canvas-back, 2; Redhead, Bluebill, Bufflehead, Ruddy and Golden-eye, 4.

*Albuquerque, New Mexico, March 4, 1921.*

<sup>3</sup>Relative Abundance of Ducks in the Rio Grande Valley, Condor, XXI, May, 1919. p. 122.

## A BIRD CENSUS AT PRESCOTT, WALLA WALLA COUNTY, WASHINGTON

By LEE RAYMOND DICE

WITH ONE PHOTO

THE following article is a report on a series of counts made of the birds on a small area. The birds on the selected area were counted five times each day for a period of ten days. Information was obtained about the variation in the number of species and of individuals at the different times of day as well as about the average number of birds per unit area. The method of study was outlined by Dr. R. M. Strong, and the work was performed by the author during June, 1908.

The area chosen is located in the Touchet Valley, two miles east of Prescott, Walla Walla County, Washington. The region is a high rolling prairie through which the valley runs in a general direction from east to west (see Dice, Univ. Calif. Publ. Zool., vol. 16, 1916, pp. 293-326). The valley at this place is about one-half mile in width, and the hills rise abruptly on either side. On account of the relatively scanty rainfall, trees, under natural conditions, are confined to the ground along the small river and along a little slough. Irrigation now is practiced in the valley, and numerous orchards and groves of trees occur. The soil, both in the valley and on the hills, is rich and supports without irrigation an abundant growth of grasses or cereals.

The census area is nearly square, being a little over 200 yards on a side. Its area is 9.1 acres. It extends north from the small river, including the stream and a strip of gravel bar. Just east of the area is a group of farm buildings, and one small barn was located near the middle of the area. About one-half of the area was an open field planted in potatoes and beardless barley; a small strip near the river and along the west side of the area had been allowed to grow up thickly to trees, brush, and briars; most of the remainder was in orchard and garden. The conditions in general are typical of those found along the valley at the present time, and differ considerably from the natural state.

The native trees and shrubs are willow, wild cherry, dogwood, cottonwood, alder, birch, thorn, and elderberry. Introduced trees and shrubs growing on the area are apple, pear, plum, peach, apricot, cherry (in fruit), locust, hazelnut, walnut, chestnut, and osage. The cottonwoods and locusts attain a height of 80 to 100 feet.

The method of taking the census was to pursue a definite course back and forth through the area, going slowly and covering it quite thoroughly, a strip at a time. The time occupied in taking each census was about one hour. The times of starting were: 4:30 A. M., 7:30 A. M., 10:30 A. M., 2 P. M., and 5 P. M. A field glass was used and all birds possible were identified. No bird was included in the count unless its identification was certain, and as great accuracy as possible was used in counting. Some birds move so rapidly from place to place that an absolutely accurate count is impossible; with these, all were

counted that were seen in the space being covered at the time; and it is believed that those missed altogether would about balance those counted twice.

At the beginning of each census period the temperature in the shade of the high trees was recorded, using a common thermometer, which might not have been entirely accurate, though it shows well the variation in temperature at the different periods.

The accompanying table gives the results of the census. The total number of species observed was thirty-five. In the table they are arranged in the order in which they are given in a report already published on the birds of the region (Dice, *Auk*, vol. 35, 1918, pp. 40-51, 148-161). The average number of species seen on each trip was about fifteen, and the average number of individuals was

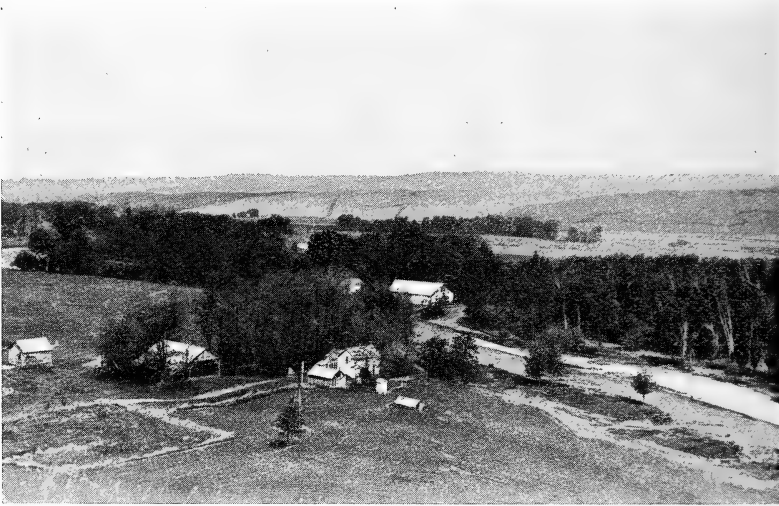


Fig. 19. THE TOUCHET VALLEY TWO MILES EAST OF PRESCOTT, WALLA WALLA COUNTY, WASHINGTON. THE VIEW IS TOWARD THE NORTH-WEST, AND THE CENSUS AREA IS ON THE RIGHT OF THE RIVER, BEGINNING A SHORT DISTANCE BEYOND THE BARN.

about sixty-nine. Two species, the Chipping Sparrow and the Robin, were seen at every period of observation. Four species, the Ruffed Grouse, Say Phoebe, Western Tanager, and Cedar Waxwing, were each seen but once. The other species occupy intermediate positions.

From the table it will be seen that there is a somewhat regular variation in the number of individuals and species seen at the different periods. The number seen is greatest in the middle of the morning and is slightly less in the early morning and in the evening. It is not believed that the number of birds on the area varied much at the different times of day or from day to day. A few birds undoubtedly came to the area to feed; some Lewis Woodpeckers, at least, came from the nearby woods to feed on the ripe cherries. Other rarer birds in moving about the valley occasionally visit the area; for instance, the Ruffed Grouse, which ordinarily lives in the denser woods along the stream, was noted once during this census. These normal movements, with species present in few



numbers, undoubtedly cause variations in the number of individuals present on the area, and some species would only occasionally be represented. However, the movements on and off the area would about balance each other, and the bird population on the area should remain about the same; for species such as the Robin, present in large numbers, even the number of individuals would probably remain nearly constant.

The variation in the number of birds seen at the different periods of observation during the day must be due to a different proportion of those present being seen. It will be readily admitted that the count never included all the birds present. Many birds are very inconspicuous unless moving, and many undoubtedly escaped observation by keeping out of sight in the grass or brush. Birds in song are especially likely to be noted. The relative activity of the birds at different times of the day is probably the explanation of the variations in the count at the various periods.

No attempt will be made to discuss the factors which might influence the activity of the birds at different times of the day. It may be pointed out, however, that, contrary to the condition usually found during periods of migration, the greatest number, both of species and individuals, was seen not in the very early hours but a little later in the morning. The number of birds seen decreases again as the heat of the day comes on, and it seems that the activity of the birds was influenced, at least to some extent, by the temperature.

It is believed that the average total number of birds seen gives very closely the number of individuals ordinarily present in June on the area. Probably this average is just a little less than the number of birds actually present. Calculated to acres, our figures give 7.552 individual birds per acre of ground. As the conditions along the Touchet Valley are very similar for at least ten miles in either direction, it is probable that about the same number of birds per acre will be found all along the stream in this region. The width in the valley covered by conditions like those on the census area would probably be on the average about one-quarter mile. This would give for this season a bird population of about 1200 per running mile along the stream. The prairie away from the vicinity of the stream has a distinctly different avifauna, and supports a decidedly less number of individuals per acre.

It will be noted that nearly half the individual birds seen on the census area were Robins. These birds were attracted to some extent by the ripe cherries on the area, but they are very abundant throughout the valley, being by far the most abundant bird along the river. A number of other species of birds, not found on the census area during the time of this study, occur in the valley and many of them have been seen on the area at other times. In the more heavily forested and more secluded parts of the valley the number of individuals of the more retiring species is undoubtedly greater than the number recorded in this census. It seems certain, then, that the average number of individuals per acre of the different species can be only approximately determined from the results of this census. Probably for the more common species, which were seen on nearly every trip, the results are more dependable. It would seem probable, after allowing a large margin for error, that the total number of individuals per unit area in the valley as determined by this study, can be considered quite dependable.

AVERAGES OF BIRDS SEEN ON CENSUS AREA  
PRESCOTT, WASHINGTON; JUNE 11-20, 1908

	4:30 a. m.	7:30 a. m.	10:30 a. m.	2:00 p. m.	5:00 p. m.	Total times seen	Average individ- uals per period	Average individ- uals per acre
Temperature, Fahr.	43.9	56.8	65.9	67.2	66.2			
Sandhill Crane .....	0.1	.....	.....	.....	0.1	2	0.04	0.004
Killdeer .....	0.8	0.5	0.4	0.5	0.9	19	0.62	0.068
Bob-white .....	0.3	1.2	1.1	1.4	1.0	29	1.00	0.110
Canada Ruffed Grouse .....	0.1	.....	.....	.....	.....	1	0.02	0.002
Western Mourning Dove .....	1.4	3.2	2.3	2.1	1.8	40	2.16	0.237
Sparrow Hawk .....	1.7	1.3	1.6	1.1	1.2	46	1.38	0.152
Batchelder Woodpecker .....	.....	0.4	0.5	0.6	0.3	15	0.36	0.040
Lewis Woodpecker .....	3.9	6.0	6.8	5.6	4.8	48	5.42	0.596
Red-shafted Flicker .....	1.3	1.1	2.0	1.4	1.0	33	1.36	0.149
Eastern Kingbird .....	1.3	0.4	0.9	0.8	0.8	31	0.84	0.092
Say Phoebe .....	.....	0.1	.....	.....	.....	1	0.02	0.002
Western Wood Pewee .....	0.5	0.4	0.2	.....	0.5	16	0.32	0.035
Magpie .....	4.1	4.4	6.0	5.9	3.6	44	4.80	0.527
Nevada Cowbird .....	0.4	0.1	.....	.....	0.1	5	0.12	0.013
San Diego Red-wing .....	.....	0.1	0.1	.....	.....	2	0.04	0.004
Western Meadowlark .....	0.2	0.1	0.2	0.3	0.1	8	0.18	0.020
Bullock Oriole .....	0.3	0.4	0.4	0.4	0.2	10	0.34	0.037
Brewer Blackbird .....	1.1	.....	0.1	0.1	.....	5	0.26	0.029
Pale Goldfinch .....	1.1	0.3	0.5	0.2	0.1	19	0.44	0.048
Western Chipping Sparrow .....	4.6	4.9	5.2	4.9	3.9	50	4.70	0.516
Merrill Song Sparrow .....	3.9	4.0	2.7	3.0	2.3	49	3.18	0.349
Slate-colored Fox Sparrow .....	0.6	0.3	0.5	0.2	0.3	13	0.38	0.042
Black-headed Grosbeak .....	1.7	1.9	3.5	1.0	1.5	46	1.92	0.211
Lazuli Bunting .....	1.9	2.4	1.5	1.6	1.3	37	1.74	0.191
Western Tanager .....	.....	.....	.....	0.1	.....	1	0.02	0.002
Cedar Waxwing .....	.....	0.2	.....	.....	.....	1	0.04	0.004
Western Warbling Vireo .....	0.2	1.3	0.6	0.7	0.5	22	0.66	0.073
Eastern Yellow Warbler .....	1.1	2.1	1.5	1.1	1.2	37	1.40	0.153
Macgillivray Warbler .....	0.4	0.6	0.4	0.4	.....	15	0.36	0.040
Long-tailed Chat .....	.....	.....	0.1	0.1	0.1	3	0.06	0.007
Redstart .....	0.6	0.5	0.9	0.7	0.4	17	0.62	0.068
Catbird .....	0.5	0.6	0.3	0.2	0.3	14	0.38	0.042
Red-breasted Nuthatch .....	.....	.....	.....	0.3	0.1	4	0.08	0.009
Long-tailed Chickadee .....	0.6	4.3	3.5	0.8	2.6	22	2.36	0.259
Western Robin .....	26.4	33.9	33.6	30.3	31.3	50	31.10	3.417
Average species .....	15.3	16.2	15.7	14.2	14.1	15.1	.....	.....
Average individuals .....	61.1	77.0	77.4	65.8	62.3	.....	68.72	7.552

*University of Michigan, Ann Arbor, November 4, 1920.*

## ADDITIONAL NOTES ON THE WATER AND SHORE BIRDS OF NETARTS BAY, OREGON

By STANLEY G. JEWETT

WITH TWO PHOTOS BY O. J. MURIE

THE species recorded in this list are additions to those noted in my paper on the birds of this region in *THE CONDOR*, vol. xvi, 1914, pp. 107-115. During the past eight years I have had occasion to visit Netarts Bay at various seasons and now have notes covering practically every month of the year. A year's continuous residence there would no doubt result in the addition of several species which are known to occur elsewhere on the coast of Oregon.

***Colymbus holboellii*.** Holboell Grebe. Occurs commonly during the winter both on the bay and in the ocean near-by. Specimens found dead on the beach December 8, 1913, and March 6, 1916.

***Gavia pacifica*.** Pacific Loon. An adult female in high plumage was found dead on the beach August 14, 1914. The bird had an injured wing and the body was very much emaciated, indicating that it had starved to death. Other birds of this species were seen on the bay during March, 1916.



Fig. 20. NORTHERN PHALAROPE. NETARTS, OREGON, MAY 18, 1913.

***Larus argentatus*.** Herring Gull. From September to March this species is not uncommon. Usually found in small flocks and does not mix with the more common Western and Glaucous-winged gulls.

***Larus delawarensis*.** Ring-billed Gull. Occurs commonly in flocks with the Western and California gulls, during the fall migrations.

***Larus heermanni*.** Heermann Gull. First recorded July 2, 1914, on the ocean off Netarts, when several were seen. On September 24, 1920, a lone bird of this species very obligingly lit on the sandy beach in front of a moving picture camera being operated

by William L. Finley. It was probably attracted by the swarm of Western Gulls being fed while having their pictures taken.

***Larus philadelphia*.** Bonaparte Gull. A single example taken in front of the hotel at Netarts on May 2, 1916. Another was seen the same day.

***Xema sabini*.** Sabine Gull. On May 1, 1916, an adult female was taken on the beach just inside Netarts Bay. September 24, 1920, several were seen both on the ocean beach and flying over the bay. By the 26th they had become common, five or six being seen each day. This unusual migration consisted of both adults with the black head and immatures with mottled plumage, the latter predominating. A few of those seen appeared to be exhausted, sitting on the beach and allowing me to approach within a few feet before they took wing.

***Puffinus griseus*.** Sooty Shearwater. Found commonly on the ocean off Netarts during the early part of July, 1914. A dead one found on the beach on September 9, 1917.

***Puffinus tenuirostris*.** Slender-billed Shearwater. A specimen found dead and preserved by Mrs. Iva Neilson on May 11, 1916, is the only record I have for the locality.

***Oceanodroma furcata*.** Fork-tailed Petrel. Breeds commonly on the Three Arch Rocks National Bird Reservation, just off the entrance to Netarts Bay. While taking moving pictures on these rocks during July, 1914, we found fresh eggs and young in all stages on July 2 to 4.

***Oceanodroma kaedingi*.** Kaeding Petrel. This species outnumbered *furcata* ten to

one on the Three Arch Rocks. On July 2 to 4, 1914, we found fresh eggs, and young just hatched. They were entirely nocturnal, not a single bird being seen during the daylight hours. These and the Tufted Puffins nested in burrows in the soft earth on the north side of the outer rock.

**Phalacrocorax auritus albociliatus.** Farallon Cormorant. Common, breeding on Three Arch Rocks; occurs on the bay and ocean at all times of the year. On July 2 to 4, 1914, all the eggs had hatched and some of the young were half grown.

**Pelecanus californicus.** California Brown Pelican. This species usually arrives from the south about the middle of August, becoming common by September 1. The birds frequent the sandbars in the bay and are a great attraction to the tourists visiting the beach. On September 26, 1920, they were still common on the bay, but I have not seen them during my October visits.

**Mareca americana.** Baldpate. This duck frequents the mud flats at the south end of the bay practically all winter. They are usually found in large flocks and considerable numbers are killed by local sportsmen each year. An exceptionally large flock was seen resting on a sandbar on March 4, 1916.

**Nettion carolinense.** Green-winged Teal. A few of these ducks visit the bay dur-



Fig. 21. WESTERN SANDPIPERS ON THE BEACH AT NETARTS, OREGON, SEPTEMBER, 1913.

ing the winter, but most of them migrating through the country keep to the fresh water ponds and lakes inland. In a bag of ducks examined on November 9, 1915, killed near the south end of the bay, there were several of this species.

**Erismatura jamaicensis.** Ruddy Duck. I have but two records of the occurrence of this species, specimens taken February 4, 1915, and March 4, 1916. Both were in the shallow water at the south end of the bay.

**Branta canadensis canadensis.** Canada Goose. A common migrant from September to March. Numbers are killed by hunters during the open hunting season. On July 3, 1914, a lone goose of this species spent the day on the ocean in the calm water in the lee of Three Arch Rocks.

**Branta nigricans.** Black Brant. Common on the bay from December to March, when they congregate in large flocks before moving northward. Known locally as "China Geese" from their incessant calls while in flight.

**Rallus virginianus.** Virginia Rail. Fairly common in the small salt grass area at the south end of the bay. Occasionally killed by hunters in pursuit of Wilson Snipe. An adult female was taken there on November 26, 1914.

**Gallinago delicata.** Wilson Snipe. Common migrant, occurring in numbers during both winter and spring.

**Macrorhamphus griseus scolopaceus.** Long-billed Dowitcher. Seen but once, when three were noted and two taken on the beach near the Netarts Hotel, May 2, 1916.

*Portland, Oregon, January 20, 1921.*

## NEW BIRD RECORDS FOR NORTH AMERICA WITH NOTES ON THE PRIBILOF ISLAND LIST<sup>1</sup>

By JOSEPH MAILLIARD and G. DALLAS HANNA

DURING the summer months of 1920 the junior author was able to do a small amount of bird collecting on his trip to the Pribilof Islands, Alaska. Some species of considerable interest were secured and are listed below. All specimens collected are in the museum of the California Academy of Sciences, and the senior author is responsible for their identification.

### SPECIES NOT HERETOFORE RECORDED FROM NORTH AMERICA

**Micropus pacificus.** Japanese Swift. A female was obtained on St. George Island, Alaska, August 1, 1920. It was found flying over the tundra and along cliffs.

**Lanius mollis.** Eversmann Shrike. A female alighted on the U. S. S. *Saturn* on September 23, 1920, and was captured. The vessel at the time was 260 miles west of Sitka, Alaska, and while the bird was not actually captured within the boundaries of North America it very likely had flown from there. The advisability of adding the species to the North American list upon this record may be questioned, but the matter is hereby brought to the attention of the American Ornithologists' Union.

### SPECIES NEW TO THE PRIBILOF ISLANDS

**Loxia leucoptera leucoptera.** White-winged Crossbill. A female was taken on St. Paul Island, Alaska, August 9, 1920. It was found feeding on the unripe seeds of the wild parsnip near Half Way Point and is the first record for the Pribilofs. The individual was in such a state of plumage, unlike any other example in collections immediately available, that it was sent to the United States Biological Survey where it was identified by Dr. Harry C. Oberholser as above.

### NOTES ON FORMER PRIBILOF ISLAND RECORDS

The following notes are to be used in connection with the complete list of Pribilof birds published by the junior author in Bureau of Fisheries Document 872 (1919) and the additions thereto published in *THE CONDOR* (XXII, no. 5, 1920, pp. 173-175). A total of 129 species was included in the 1919 list. Three more were added in *THE CONDOR* list and a fourth was restored. These with the two given above make the total now known from the Pribilof Islands 135 species and subspecies. Specimens of all but six of these have been collected. The Islands are the type locality for five forms, and altogether 16 have been added

<sup>1</sup>Contribution from the California Academy of Sciences.

to the North American list from collecting work done there. The number of breeders and regular migrants is only 45 species. The trebling of this by wanderers is a fair commentary upon the favorable situation of the Islands as a resting place.

On account of discrepancies in two published reports which were based upon a collection made by Messrs. Greeley and Snodgrass in 1897, it seemed desirable to examine again the specimens of those species which they were first to secure. Through the courtesy of Prof. J. O. Snyder of Leland Stanford University this has been possible. The original collection went to that institution but it is found now to be sadly depleted.

**Arquatella maritima couesi.** Aleutian Sandpiper. Mr. Alvin Seale, writing upon the Greeley-Snodgrass collection (Proc. Acad. Nat. Sci., Phila., 1898, p. 139), lists five specimens of this species as having been taken on St. Paul Island, August 17 [1897]. Dr. Joseph Grinnell identified the same collection and published a paper thereon in 1901 (Condor, III, no. 1, p. 19). He omits the Aleutian Sandpiper altogether from his list, but includes eight specimens of the Pribilof Sandpiper, whereas Seale had given but six of that species. The collection now contains but two birds of either species. One of these, no. 3498, a female taken July 25, was originally labelled "*couesi*" but has been changed by H. C. O[berholser]. to "*ptilocnemis*". The other, no. 3527, a female taken August 22, was originally labelled "*ptilocnemis*". Since Grinnell failed to find any specimens of *couesi* in the collection and one of the birds so labelled proves not to be that species, it seems safe to assume that the record by Seale was based upon incorrect identification. Fortunately it is not necessary to strike the species from the list, because it has been met with two or three times by the junior author of this article. One bird, not sexed, was taken on the beach at the Village, St. George Island, Alaska, February 12, 1917; original number, 1004. It is not certain that it was the first specimen taken by him. The early record books and specimens have gone to the National Museum and are not now readily accessible.

**Pisobia acuminata.** Sharp-tailed Sandpiper. This species is recorded by Seale (*op. cit.*, p. 139) as having been taken on St. Paul Island, August 19 [1897]. Grinnell (*op. cit.*, p. 19) refers to it as the second specimen from the Pribilofs and as having been taken on August 17. He refers to Bishop's record (N. A. Fauna, no. 19, 1901, p. 66) for St. George Island as the first and in this he has been followed. Although the specimen cannot at this date be found there seems to be no reason to doubt the correctness of the identification, and the first record should be attributed to Seale, not Bishop (Hanna, Bur. Fish. Doc. 872, 1919, p. 107).

**Totanus melanoleucus.** Greater Yellow-legs. Seale (*op. cit.*, p. 139) records a specimen of this species as having been taken on St. Paul Island, August 23 [1897]. Grinnell (*op. cit.*, p. 20) refers to the same specimen (no. 3543, Stanford University) as having been taken on August 17. The specimen bears two labels, each of which is dated August 29, 1897.

**Oenanthe oenanthe oenanthe.** Wheatear. The specimen taken on St. Paul Island, August 29 [1897], was recorded by Seale and later by Grinnell. A second specimen was taken by Hanna, September 1, 1917, on St. Paul Island and was mentioned briefly in the Auk (xxxvii, 1920, p. 249).

#### OTHER PRIBILOF SPECIES OF GENERAL INTEREST

A few rare visitors to the Pribilofs should be mentioned because of their

second appearance. Two Long-billed Dowitchers were taken on St. Paul Island, August 27, 1920, at Northeast Point. The first record appeared in the Condor (xxii, 1920, p. 173).

The second specimen of a Least Sandpiper, a male, was taken at Northeast Point, St. Paul Island, August 27, 1920. The first, taken by Osgood, was recorded in the Auk (xxxiii, 1916, p. 401).

Two more specimens of the Baird Sandpiper were taken on St. Paul Island in 1920, at Northeast Point, August 12. Three were taken on the same island in 1914 and recorded in the Auk (xxxiii, 1916, p. 401).

It might be added here that the Arctic Tern, Sabine Gull, Pectoral Sandpiper, and Sharp-tailed Sandpiper are more than accidental visitors. The latter two species in particular have been collected in considerable numbers the past few years.

*San Francisco, California, March 1, 1921.*

## FROM FIELD AND STUDY

**Notes on the Hypothetical List of California Birds.**—In "A Distributional List of the Birds of California" (Pacific Coast Avifauna, no. 11, 1915) three species have been placed in the hypothetical list by Dr. Joseph Grinnell on the ground of insufficient evidence, though the specimens are still in the British Museum and were recorded in the "Catalogue of Birds". I have recently (November, 1920) had an opportunity to examine these birds, and the results are possibly worth recording.

*Philohela minor*. Woodcock. One specimen from California recorded by Dr. R. B. Sharpe, "Catalogue of Birds," xxiv, p. 681; this bears a Seebohm label, "E. Mus. Henry Seebohm", and on it is written "*Scolopax minor*, ♂, California, (H. Whitely)." The number in the British Museum Register is written on the back, 96.1.1.97. Writing in 1888, Seebohm in his "The Geographical Distribution of the Charadriidae," says (p. 504) of the Woodcock: "Its range extends northwards to lat. 50°, and southwards into Texas, but its longitudinal range extends from the Atlantic only halfway across the continent." Evidently Seebohm had no California record of the Woodcock when this was written, or if he had, he disregarded it. Henry Whitely was curator of the museum of the Royal Artillery Institution at Woolwich in 1865, where were deposited the natural history collections made by John Keast Lord, naturalist to the British North American Boundary Commission. These collections included a few birds collected by Lord in California. Henry Whitely was for some years a natural history agent, and received a great deal of material from abroad, but the locality "California" will have to be disregarded as far as his authority is concerned.

*Limosa haemastica*. Hudsonian Godwit. Three specimens from California recorded by Dr. R. B. Sharpe, "Catalogue of Birds", xxiv, pp. 391 and 756; all from the Seebohm collection. I found only two of these, both with only the Seebohm label. One is marked "♀", and is probably an adult in winter, the number in the British Museum Register is, 92.8.3.326; the other is marked "♀" and is an adult, and the label bears the British Museum registered number, 96.7.1.820; both have "California" written on the labels. The third, which I was unable to find, is, according to the "Catalogue of Birds" (p. 391), an adult male with the same data and origin. Seebohm in "The Geographical Distribution of the Charadriidae" says (p. 393) that the Hudsonian Godwit has occurred twice in Alaska but nowhere else on the Pacific coast of North America, so these records may also be disregarded. That Seebohm should have had a Woodcock and three Hudsonian Godwits from California in his collection, without comment, and that Sharpe should have published the records, is sufficient reason for a detailed examination of the evidence.

*Pyrhuloxia sinuata sinuata*. Arizona Cardinal. One specimen from California recorded by Dr. R. B. Sharpe, "Catalogue of Birds", xii, p. 159; this has a blank label with "California" and no registered number; the origin was unknown as none is given



in the catalogue, and the locality can be regarded as unreliable.—J. H. FLEMING, *Toronto, Ontario, January 17, 1921.*

**California Pigmy Owl from Cucamonga Canyon, Southern California.**—I wish to record the capture by Gordon Nicholson of Ontario, California, of a male Pigmy Owl (*Glaucidium gnoma californicum*) on November 11, 1920, at an altitude of about 2800 feet in Cucamonga Canyon—a rugged steep-walled canyon about six miles north and east of Upland, San Bernardino County. The bird was sitting in a sycamore tree in the base of the canyon. The stomach was sent to Dr. H. C. Bryant at Berkeley, and he sends the following report as to its contents: Condition of stomach, full; contents, one katydid (*Scudderia furcifera*) and three grasshoppers (*Melanoplus devastator*).—WRIGHT M. PIERCE, *Claremont, California, December 29, 1920.*

**An Addition to the Oregon List of Birds.**—On October 3, 1920, while walking along the banks of the Snake River near Ontario, Oregon, my attention was attracted by a single tern flying over the river. One of our party shot the bird, which proved to be a female Common Tern (*Sterna hirundo*). On October 4, a number were observed and another specimen collected. On my return to Portland I was surprised to learn that there was no printed record of the occurrence of this bird in the State. The first specimen secured is now in my possession and I take pleasure in adding this species to the State list.—IRA N. GABRIELSON, *Portland, Oregon.*

**Early Spring Notes on Birds of Coronado Islands, Mexico.**—On March 5, 1921, Messrs. A. W. Anthony, Geo. H. Field and the writer landed on North Coronado Island and camped there until the 9th. On the 7th, we rowed over to Middle Island; but the swell broke so heavily on the rocky shore that we did not try to land. As this is several weeks earlier than any collector that I know of has landed on the islands, some notes on the birds we found may be of interest. The winter has been very dry on the islands and the growth of annual plants is very scanty this season.

Rhinoceros Auklet. *Cerorhinca monocerata*. Mr. Anthony saw one.

Cassin Auklet. *Ptychoramphus aleuticus*. Many nesting burrows had been cleaned out, and a little nest material had been taken into some burrows; but no birds were in the burrows we opened. No birds were seen at sea.

Xantus Murrelet. *Brachyramphus hypoleucus*. Several seen swimming and flying at sea. One shot.

Western Gull *Larus occidentalis*. Thousands were present on North Coronado Island, but nesting had not begun. No other species of gull was seen, and scarcely any immature birds of this species, although immature birds were abundant on San Diego Bay at the time.

Pacific Fulmar. *Fulmarus glacialis glupischa*. Mr. Anthony saw one.

Black-vented Shearwater. *Puffinus opisthomelas*. Several large flocks were feeding on schools of sardines between San Diego and the islands. A few stragglers were flying near the islands.

Farallon Cormorant. *Phalacrocorax auritus albociliatus*. Nests were scattered through the pelican colonies, sets mostly incomplete. A partly incubated set of four was taken.

Brandt Cormorant. *Phalacrocorax penicillatus*. Two small colonies were nesting on nearly perpendicular cliffs at the north end of the island. Looking from above I saw one set of five eggs; others were smaller, probably incomplete.

Baird Cormorant. *Phalacrocorax pelagicus resplendens*. Mr. Anthony saw one cormorant with distinct white flank patches.

California Brown Pelican. *Pelecanus californicus*. The pelican colonies have been enlarged until they now cover nearly all of the east side of North Island. Many hundreds of nests were already occupied, but most of the sets were incomplete. I took one set of four eggs.

Black Oystercatcher. *Haematopus bachmani*. Two shot, another seen.

Sparrow Hawk. *Falco sparverius*. One seen.

Bald Eagle. *Haliaeetus leucocephalus*. An immature Bald Eagle passed over North Coronado Island, pursued by hundreds of Western Gulls making a tremendous racket; but they took care not to come too close to the Eagle.

Duck Hawk. *Falco peregrinus anatum*. One seen.

Say Phoebe. *Sayornis sayus*. One seen.

Intermediate Sparrow. *Zonotrichia leucophrys gambeli*. A number, apparently winter residents, were seen. One shot.

San Clemente Song Sparrow. *Melospiza melodia clementae*. Several seen, two shot. Not very near breeding.

Rock Wren. *Salpinctes obsoletus*. Two seen.—FRANK STEPHENS, *Museum of Natural History, San Diego, California, March 15, 1921*.

**Does the Wren-tit Sing a Scale?**—I have so often met with differences of opinion regarding the notes of the Wren-tit (*Chamaea fasciata*), and these differences of opinion spring from the minds of such excellent bird students, that I am led to offer a word regarding my own impressions of the bird's vocalization. I had thought Dr. J. Grinnell's paper (CONDOR, xv, 1913, pp. 178-181) a pronouncement, almost, of the last word upon the subject; and as I review his excellent article, there appears but little for me to add. In his analysis of notes, under caption A, no. 1, he describes what is perhaps the most commonly recognized performance of this bird in these words: "Loud series of staccato notes all on the same pitch but with decreasing intervals, the last of the series run together to form a trill: pit-pit-pit-pit-pit-tr-r-r-r-r. Several counts gave from three to five of the first, distinctly-uttered notes." With this description of note no. 1, my impression agrees almost absolutely. Only very rarely have I heard the slightest degree of flattening from the original pitch as the interval of time diminishes. Yet again and again, during work with many academic generations of students, have I had the question asked, "What is the bird in the hills that sings down the scale?" I have long since ceased to suggest the Canyon Wren, but attempt instead the call of the Wren-tit (keeping at least on the pitch), and they at once recognize the bird. Just what is the psychology of interpreting this note as a descending scale, it is hard to state, except it be suggestion of falling bodies by the accelerated tempo. Certainly the average listener would not consider that flattening by less than a quarter of a tone could properly be considered as a descending scale.

The only marked decline in pitch that I have recognized for the Wren-tit is described in Grinnell's note no. 3 which he syllabifies as *keer-keer-keer-keer*, with slightly falling pitch. Here the decline in pitch does not exceed one and a half or two tones during the repetition of five to ten notes. Certainly such would constitute a pretty finely chromatic scale.

Perhaps I may be pardoned for adding a suggestion or two in regard to Grinnell's syllabification of note no. 1. The simple *pit-pit-pit*, etc., can be fairly well imitated by the human whistle, but the bird sometimes complicates the performance by a grace note that renders the syllabification more properly *plit-plit-plit*, or even *tupit-tupit-tupit*. I have never yet met the mere human who could reproduce this variant to any degree accurately. Then, again, this note is capable of a remarkable degree of ventriloquism and this fact is made use of by the bird, whether with intent to deceive or not, I can not say; but certainly it produces a deceptive effect.

I appreciate the fact that these remarks do not constitute any decided addition to our sum of knowledge; but it is hoped that they may serve as a corroboration of the previous observations referred to, on this unique bird.—LOYE MILLER, *Southern Branch, University of California, Los Angeles, February 17, 1921*.

**Southern California Screech Owl in Western Orange County.**—Although I had met with this owl in the live oak association of the Puente Hills, ten miles to the northeast, and in the Orange County Park, twenty miles to the east, it was not until 1913 that I observed it in the vicinity of Buena Park. Thirty years ago this vicinity was a treeless plain, but now some of the eucalyptus trees are quite large, especially those on our property. Screech Owls (*Otus asio quercinus*) first appeared in December, 1913, and have since been seen, and more often heard, during every month of the year. I have suspected them of nesting for several years, but as the only large trees are eucalyptus, which afford poor shelter for this purpose, I was rather doubtful until June 13, 1920, when my wife and I found two adults feeding three full-fledged young in some trees near our house. They appeared at dusk on the lower branches of the trees, and the old birds hunted by

flying to the ground and returning to feed the young. We were unable to find out what their prey was. This performance was repeated for several evenings; then they were not seen again, although their soft call-notes were heard frequently throughout the summer. These owls are a welcome addition to our fauna and I hope they will continue to favor us with their presence.—JOHN MCB. ROBERTSON, *Buena Park, California, February 16, 1921.*

**American Crossbill Eating Elm Aphis.**—Opportunity for close observation on the feeding habits of the American Crossbill (*Loxia curvirostra minor*) were afforded the writer on the University of Washington campus at Seattle on June 17, 1920. In the mid-morning I heard the *chup, chup, chup* of some Crossbills, and shortly a dozen or more of the birds alighted on the lower branches of some cork elms, within ten feet or less of the ground. The birds were not disturbed by my close approach and it was possible to get within three to five feet of them. Red plumaged males, other individuals of greenish yellow coloration, and one or two with streaking indicative of juveniles were noted in the flock which was scattered through half a dozen adjacent trees.

The birds seemed to prefer to feed while hanging inverted; in a majority of cases this was the position taken even when suitable forage could have been obtained from an upright posture. When climbing from one branch to another a few of the Crossbills were seen to use their bills, after the manner of parrots, but only in making a slight change of position while a bird was hanging upside down, or when regaining an upright position.

No buds were to be seen on the trees and for a short time I was puzzled to know what the birds were feeding upon. They were attacking certain of the leaves which were curled up on one edge, cutting these rolls open and getting something from within. Gathering a few similar leaves from a tree and picking up some that had fallen after being cut open by the birds, it became evident that a woolly aphis, which had caused the curling of the leaf margin was the item of food being sought by the Crossbills. The attack of this insect causes the blade of the leaf to curl over, forming a cylindrical roll within which the aphids can feed and multiply unmolested by most of their enemies.

Further watching of the Crossbills showed that the birds had learned the haunt of these particular aphids and also a method for obtaining them. The roll-like cases were cut open lengthwise, but in rather irregular fashion, as well as could be expected of a species with such an unhandy pair of "scissors"; then the tongue would be inserted and the aphids withdrawn. The process was not as efficient as it would have been with a typical insect-eating species possessed of a slender bill, and many of the insects adhered to the outside of the birds' mandibles. From time to time a bird would cease feeding and wipe the adhering bugs and "juice" from its bill.

That this method is not an entirely novel one with the birds observed by me is indicated by the fact that Visser (*Auk*, xxvi, 1909, p. 150) records briefly similar behavior of Crossbills in taking aphid galls on petioles of cottonwood in South Dakota. Still other observers have reported the taking of insect food by Crossbills. "Worms" [probably borers] have been eaten in South Carolina (Wayne, *Auk*, v, 1888, p. 208), and hairy caterpillars, the larvae of *Glisiocampa disstria* at Brandon, Vermont (M. M. Miller, *Auk*, xvi, 1899, p. 362), while in California lepidopterous pupae have been found in the crop of *Loxia curvirostra bendirei* near Lake Tahoe (L. H. Miller, *CONDOR*, xxii, 1920, p. 78.—TRACY I. STORER, *Museum of Vertebrate Zoology, Berkeley, California, March 15, 1921.*

**Further Notes on the Harlequin Duck's Food Habits.**—The following may be of interest, with reference to Dr. Bryant's note, "The Harlequin Duck in the Yosemite Valley" (*CONDOR*, xxiii, p. 35), in which he says, that "apparently the Harlequin does not procure all of its food by diving . . .". On May 14, 1914, I was making my way up St. Leon Creek, British Columbia, when I saw a pair of Harlequin Ducks (*Histrionicus histrionicus*) sitting out on a sand-bar, busily engaged in preening. A thick undergrowth enabled me to get very close to them. I had been watching them for several minutes, when another male flew down the creek and settled close to the pair. The first male resented this intrusion, and drove the new arrival into the water, and he was at once carried away by the swift water and lost to sight. The pair soon followed him into the creek, and I fully expected to lose sight of them, too; but they immediately com-

menced diving and I was surprised to see the headway they made against the current, which was very swift at this point. Coming to the surface, they were swept down stream and dived again to recover lost ground. I soon saw that the feet were not used to swim with, but that the birds shoved themselves along with them over the stony bottom, in very much the same way that the Dipper moves forward while under the water in swift current.

Apparently becoming tired by these exertions, the ducks ceased diving and were soon swept out of sight. Later in the day I saw a pair at the mouth of the creek where it empties into the Arrow Lake; both were diving in the deep water, and the birds were immersed for a far longer period here, than they were in the swift water. Soon the pair moved along the shore into a small bay, the beach of which is almost entirely made up of large granite boulders, at this time partly covered by high water. I kept the pair under observation with binoculars for about an hour, and during this time, though they fed continuously, I never once saw either bird completely submerged. Occasionally one would plunge its head beneath a shelving rock, sending out a spout of water with its feet; but more often they searched between the boulders at the water's edge, finding, apparently, the drowned ants and other insects that a north breeze was bringing ashore in great abundance from the surface of the lake.—WALTER B. JOHNSTONE, *Edgewood, Arrow Lake, British Columbia, March 4, 1921.*

**Duck Hawk Wintering in Ontario, California.**—During the first part of January, 1920, in the vicinity of Upland, California, a pair of falcons were seen flying high overhead, uttering their piercing cries. The birds were again seen, sitting in a large blue gum tree located at the corner of an orange grove about one-half mile from where they were first seen and perhaps two miles from the main business district of Ontario. These birds were far too wary to be collected. The birds stayed in this general locality until about the middle of February and were not seen again after that until about December 1 of the same year when they were located in the same large blue gum. On December 19, one of the birds was shot and proved to be an immature female Duck Hawk (*Falco peregrinus anatum*). On December 31 the other was collected. This bird was a male, adult. The stomach of the first bird collected was empty, and we are indebted to Dr. H. C. Bryant for a report on the stomach of the bird collected December 31. It contained largely feathers, while the gullet held the feet, a few bones and feathers of the Western Mourning Dove (*Zenaidura macroura marginella*), and pieces of flesh, apparently from the same bird.—GORDON NICHOLSON and WRIGHT M. PIERCE, *Claremont, California, March 4, 1921.*

**The White-eared Hummingbird in the Catalina Mountains, Arizona.**—I want to report the White-eared Hummingbird (*Basilinna leucotis*) as occurring in the Santa Catalina Mountains, Arizona. In 1915, a female came close to my camp by the canyon stream several successive mornings. So far as I know this bird has never been reported nearly as far from the International line. Both the Huachuca and Chiricahua mountains touch the Mexican line. I am particularly interested in the bird because I discovered it in the Huachucas, and Dr. Fisher in the Chiricahuas, in the same month. Both specimens taken were females.

That makes ten species of hummingbirds for the Catalina Mountains, namely, Rivoli, Blue-throated, White-eared, Broad-tailed, Black-chinned, Broad-billed, Costa, Allen, Rufous and Calliope.—RICHARD D. LUSK, *Winkleman, Arizona, February 22, 1921.*

**On the Flocking of Blackbirds.**—In the November, 1920, issue of THE CONDOR I read a note relative to different species of blackbirds flocking together. While living in southern Nevada (Spring Valley, Lincoln County) a number of years ago, I saw three kinds of blackbirds in the same flock many times. One year (1904) the Yellow-headed Blackbirds made their appearance and far outnumbered the Brewer and Red-winged. In later years there were a few Yellow-heads, but not nearly so many as in 1904. Some years they did not appear at all. I have not been in that region since 1909, but have often wondered just what was the significance of the irregular appearance of the Yellow-heads.—MARGUERITE RICE, *San Gabriel, California, February 20, 1921.*

## EDITORIAL NOTES AND NEWS

The annual roster of the Cooper Ornithological Club which occupies the next eight pages shows a total of 754 living members. This is just 99 more than one year ago, or an increase of 15 per cent. Either of two things might be inferred—that interest in bird study is rapidly spreading or that energetic efforts have been made to seek out all those in whom an interest had already come to exist but who had not previously affiliated themselves with the Club. With no doubt whatsoever both things are true. The first is a natural accompaniment of an expanding population, especially where there is a tendency towards growth in general culture. The second factor is the personal one involving the activity of certain individual members who wish earnestly to see the Club's sphere of usefulness continually enlarged. In the latter connection it happens that unstinted service has been rendered by our business managers, Messrs. W. Lee Chambers and J. Eugene Law. Incidentally, the last named put through the compilation of the current year's roster. And to him should be reported such changes or corrections as prove to be needed, to the end that these may be incorporated in our next year's roster.

Mr. Robert Ridgway has been accorded the Daniel Giraud Elliot gold medal by the National Academy of Sciences in recognition of his studies of birds, and especially as commemorating the appearance of Part VIII of his *Birds of North and Middle America*. Mr. Ridgway may properly be considered the most distinguished American ornithologist now living.

"The Murrelet" is the title of the "Official Bulletin of the Pacific Northwest Bird and Mammal Club" whose headquarters are at the State Museum, University of Washington, Seattle. Mr. F. S. Hall is president of this active organization and is also editor of "The Murrelet". The bulletin is in mimeograph style and hence, we assume, has no bibliographical standing. Nevertheless, the issue for May, 1921 (vol. II, no. 2), for example, contains some contributions of real value, such indeed as should justify their publication in permanent form. Among articles of particular merit in the issue designated are: *Breeding Dates for Washington Birds*, by J. Hooper Bowles; *Shore Birds at Westport, Washington*, by D. E. Brown; and *British Columbia Bird Notes, 1920-21*, by J. A. Munro.

Mr. Alfred M. Bailey, who has served the past two years as chief fur warden for Alaska under the United States Bureau of Biological Survey, has now severed his connection with the Bureau to accept a position on the staff of the Colorado Museum of Natural

History. Under commission of Director J. D. Figgins of that institution, Mr. Bailey is leaving for a year's field work in northwestern Alaska. While the first objective will be the collection of materials for exhibition purposes, special effort will be made also to gather a series of the geese of the region, so that the status of the *canadensis* group in which Mr. Figgins is particularly interested may be worked out on a more conclusive basis than has heretofore been possible.

Mr. Harry S. Swarth, with Mr. William Duncan Strong as assistant, has left for five months of field work in the Skeena River district of British Columbia. The plan of this work is in continuation of the program of the California Museum of Vertebrate Zoology to study into the faunal relations of the northwest coast region of North America. Mr. Swarth's report upon his survey of the Stikine River district made two years ago is now in press as a contribution from the Museum of Vertebrate Zoology, University of California.

### MINUTES OF COOPER CLUB MEETINGS

#### NORTHERN DIVISION

FEBRUARY.—The Northern Division of the Cooper Ornithological Club met at the Museum of Vertebrate Zoology February 24 at 8 P. M. Members present: Mesdames Allen, Ayer, Burk, Flinn, Grinnell, Law, McLellan, Neugass, Rush, Schlesinger, and Thomson; Messrs. Bell, Bryant, Carriger, Evermann, Grinnell, Lastreto, Law, Mailliard, McKibben, McLean, Strong, Storer, Swarth, Wheeler, and Wright; visitors, Mesdames Drummond, Evermann, McLean, Thomson, and Wheeler; Messrs. Coolidge, Litsey, Miller, and Schlesinger.

After the reading of the minutes of Northern and Southern Divisions the five names proposed at the January meeting were passed upon favorably. New names proposed were Mrs. Ella B. Drummond, 2739 Bancroft Way, Berkeley, by Miss Margaret Wythe; Mr. Kenneth Racey, 3262 First Ave. W., Vancouver, B. C., Mr. Lionel E. Taylor, Kelowna, B. C., and Mr. J. W. Winson, Huntingdon, B. C., by Mr. J. A. Munro.

On motion of Mr. Storer, duly seconded, it was voted to join with the Mammalogists in a field trip to Golden Gate Park on March 20, the trip to take the place of the regular March meeting. On motion of Mr. Law, seconded by Mr. Mailliard, the revised constitution was adopted by unanimous vote. Mr. Dane Coolidge then entertained the Club by narrating his experiences while capturing live birds for zoological parks. Adjourned.—AMELIA S. ALLEN, *Secretary*.

## COOPER ORNITHOLOGICAL CLUB OFFICERS

## NORTHERN DIVISION

President, Curtis Wright.  
Vice-President, Harry S. Swarth.  
Secretary, Mrs. Amelia S. Allen.

## EDITORS

Joseph Grinnell.  
Harry S. Swarth.

## SOUTHERN DIVISION

President, Donald R. Dickey.  
Vice-President, Wright M. Pierce.  
Secretary, L. E. Wyman.

## BUSINESS MANAGERS

J. Eugene Law.  
W. Lee Chambers.

The above officers, together with the following ex-presidents (not included above, all those whose membership has been continuous since incumbency) constitute the Board of Governors of the Club.

Harold C. Bryant  
Henry W. Carriger  
Herbert L. Coggins  
Barton Warren Evermann  
Ozra W. Howard  
Joseph Mailliard

Loye H. Miller  
G. Frean Morcom  
Wilfred H. Osgood  
Howard Robertson  
Fred A. Schneider  
Tracy I. Storer

## DIRECTORY OF MEMBERS OF THE COOPER ORNITHOLOGICAL CLUB

Revised to April 1, 1921.

Residence in California unless otherwise stated. Year following address indicates date that member joined the Club; year in parenthesis indicates date member became honorary or life member. Star (\*) preceding indicates life member; "\$" indicates contributor to Endowment Fund.

## HONORARY MEMBERS

Allen, Dr. J. A., Amer. Museum Nat. Hist., New York, N. Y. 1910.  
\*§Bailey, Florence M. (Mrs. Vernon), 1834 Kalorama Road, Washington, D. C. 1910 (1920).  
Beal, Prof. F. E. L. 1904 (1910). Deceased, 1916.  
Belding, Lyman, 1896 (1896). Deceased, 1917.  
Bryant, Walter E. 1894 (1894). Deceased, 1905.  
Cooper, Dr. J. G. 1896 (1896). Deceased, 1902.  
Henshaw, H. W., Biol. Survey, Washington, D. C. 1909.  
Merriam, Dr. C. Hart, 1919 16th St., Washington, D. C. 1909.  
Nelson, E. W., Biol. Survey, Washington, D. C. 1904 (1917).  
Ridgway, Robert, 3306 New Hampshire Ave., N. W., Washington, D. C. 1905.  
§Stephens, Frank, 3746 Park Blvd., San Diego. 1894 (1912).

## ACTIVE MEMBERS

Abernathy, Frieda (Mrs. S. E.), 2300 Durant Ave., Berkeley. 1914.  
Adams, Benjamin, Wethersfield, Conn. 1920.  
Adams, Miss Romola M., 912 Linden Ave., Long Beach. 1921.  
Alexander, Miss Annie M., Suisun. 1908.  
Alexander, E. Gordon, 1603 South St., Lexington, Mo. 1918.  
Allen, Dr. Arthur A., McGraw Hall, Ithaca, N. Y. 1911.  
Allen, Mrs. Amelia S., 37 Mosswood Road, Berkeley. 1913.  
Ames, Miss Isabel, 3605 20th St., San Francisco. 1920.  
Anderson, Mrs. Malcolm P., 1419 Versailles St., Alameda. 1920.  
Anderson, Dr. Rudolph M., Biol. Div., Geol. Survey, Ottawa, Ont., Canada. 1916.  
Andrews, E. R., 315 E. 19th St., Oakland. 1920.  
Applegate, Elmer I., Klamath Falls, Ore. 1921.  
\*Appleton, J. S., 1332 Citrus Ave., Hollywood. 1901 (1919).  
Armstrong, Edward E., 2249 Calumet Ave., Chicago, Ill. 1914.  
Arnold, E., Grand Trunk Ry., Montreal, Que., Canada. 1909.  
Arnold, Lewis, 2732 Benvenue Ave., Berkeley. 1921.  
Arnold, Dr. Ralph, 825 Union Oil Bldg., Los Angeles. 1893.  
Arnold, Dr. W. W., 504 N. Nevada Ave., Colorado Springs, Colo. 1911.

Arthur, Stanley Clisby, Dept. of Conservation, New Orleans, La. 1918.  
Atkinson, W. L., 35 Hawthorne Way, San Jose. 1901.  
Atsatt, Miss Sarah R., 345 S. Serrano Ave., Los Angeles. 1911.  
Austin, Lloyd, University Farm, Davis. 1920.  
Ayer, Ethel C., 1301 Jackson St., Oakland. 1920.  
Bade, Wm. F., 2616 College Ave., Berkeley. 1903.  
Badger, M. C., Santa Paula. 1915.  
Bailey, Alfred M., Juneau, Alaska. 1917.  
Bailey, Bernard, R.D. 1, Elk River, Minn. 1911.  
Bailey, H. H., R.D. 1, Miami, Fla. 1903.  
Bailey, Vernon, 1834 Kalorama Road, Washington, D. C. 1904.  
Baird, Mrs. Dudley, 2434 Prospect St., Berkeley. 1920.  
\*Baldwin, S. P., 2930 Prospect Ave., Cleveland, Ohio. 1920 (1920).  
§Bales, Dr. B. R., 149 W. Main St., Circleville, Ohio. 1906.  
Ballard, Maria V., 3399 Washington St., San Francisco. 1919.  
Bamford, Mrs. G. L., 1428 Castro St., Oakland. 1918.  
Bancroft, Griffing, Cuyamaca Club, San Diego. 1920.  
§Bangs, Outram, Museum Comp. Zool., Cambridge, Mass. 1906.  
Barker, Fred, Parkers Prairie, Minn. 1914.  
Barnes, Claude T., 359 10th Ave., Salt Lake City, Utah. 1915.  
\*Barnes, R. Magoon, Lacon, Ill. 1908.  
Barrows, Prof. Walter B., Box 1047, East Lansing, Mich. 1909.  
Bassett, F. N., 1338 8th St., Alameda. 1919.  
Batchelder, Chas. F., 7 Kirkland St., Cambridge, Mass. 1910.  
\*§Beck, Rollo H., R.D. 21, San Jose. 1894 (1919).  
Beers, Miss Catherine V., Univ. Southern Calif., Los Angeles. 1921.  
Bell, B. C., 235 8th St., San Francisco. 1919.  
Benjamin, Elbert, 109 Coral St., Los Angeles. 1920.  
Bennet, Eleanor V. V., 2904 Piedmont Ave., Berkeley. 1920.  
Bennett, R. H., 246 Southern Pacific Bldg., San Francisco. 1909.  
Bent, A. C., 140 High St., Taunton, Mass. 1909.  
Benton, Thos. H., Jr., 3200 Liberty Ave., Alameda. 1916.  
Bergtold, Dr. W. H., 1159 Race St., Denver, Colo. 1917.  
Bicknell, Mrs. F. T., 319 S. Normandie Ave., Los Angeles. 1913.  
Eigelow, Homer L., 37 Old Orchard Road, Chestnut Hill, Mass. 1910.  
\*Bishop, Dr. Louis B., 5956 Hollywood Blvd., Hollywood. 1904 (1920).  
Blake, Mrs. Edwin T., 2233 Piedmont Ave., Berkeley. 1917.  
Blayney, Nita A., 920 O St., Fresno. 1911.  
Bliss, John D., Pozo, San Luis Obispo Co. 1916.  
Boeing, W. E., The Highlands, R.D. 2, Seattle, Wash. 1914.

- Eolander, L. Ph., Jr., 1947 E. 28th St., Oakland. 1907.
- Bolt, B. F., 1421 Prospect Ave., Kansas City, Mo. 1916.
- Borell, Adrey E., 227 Calaveras Ave., Fresno. 1918.
- Bowdish, B. S., Demarest, N. J. 1910.
- Bowles, J. H., The Woodstock, Tacoma, Wash. 1903.
- Boyle, Ashby D., 380 E St., Salt Lake City, Utah. 1915.
- Boyle, Miss Una, 132 Laurel Place, San Rafael. 1921.
- Boynton, Charles T., 1005 S. Sheridan Road, Highland Park, Ill. 1919.
- \*§Bradbury, W. C., 1440 Race St., Denver, Colo. 1913 (1914).
- Braislin, Dr. William C., 425 Clinton Ave., Brooklyn, N. Y. 1910.
- Bramkamp, Richard, Banning. 1921.
- Brandt, H. W., 2025 E. 88th St., Cleveland, Ohio. 1914.
- Bridges, Mrs. Harriette W., 2628 Benvenue Ave., Berkeley. 1918.
- \*Brooks, Major Allan, Okanagan Landing, B. C., Canada. 1906 (1920).
- Brooks, L., Box 539, New Bedford, Mass. 1913.
- Brouse, W. A., 3623 5th Ave., Los Angeles. 1916.
- Brown, Arthur G., 359 Monadnock Bldg., San Francisco. 1920.
- Brown, D. E., 87 Lenora St., Seattle, Wash. 1909.
- \*Brown, Edward J., 1609 S. Van Ness Ave., Los Angeles. 1915 (1919).
- Brown, G. Franklin, Needham, Mass. 1918.
- Brown, Mrs. Herbert, 434 E. 2d St., Tucson, Ariz. 1914.
- Brownlee, Mrs. W. L., 912 S. Carondelet St., Los Angeles. 1919.
- Brune, Leo, Grand Dalles, Wash. 1919.
- §Bryant, Dr. Harold C., Museum Vert. Zool., Berkeley. 1910.
- Bull, Daniel Bernard, R.D. A, Box 158, San Jose. 1919.
- Eull, Mrs. D. Bernard, R.D. A, Box 158, San Jose. 1921.
- Burk, Genevieve S., 1601 Oxford St., Berkeley. 1920.
- Burleigh, Thos. D., Univ. Ga., Athens, Ga. 1918.
- Burnell, Miss Elizabeth, 419 S. Olive St., Los Angeles. 1921.
- Burnett, W. L., State Agr. Coll., Fort Collins, Colo. 1910.
- Burnham, Dr. Clark, Bushnell Place, Berkeley. 1907.
- Purnham, John, Timken Bldg., San Diego. 1920.
- Burns, Frank L., Berwyn Pa. 1909.
- Burtch, Verdi, Branchport, N. Y. 1910.
- Buturlin, Sergius A., Wessenberg, Esthonia, Russia. 1909.
- Calder, James A., Buena Park. 1917.
- Camp, Chas. L., Amer. Museum Nat. Hist., New York, N. Y. 1909.
- Cantwell, George G., Puyallup, Wash. 1915.
- Carpenter, George I., 129 Dean St., Brooklyn, N. Y. 1920.
- Carpenter, N. K., 3775 Kite St., San Diego. 1901.
- Carriger, H. W., 5185 Trask St., Oakland. 1895.
- Case, Rev. Bert F., East Granby, Conn. 1913.
- Case, C. M., 306 Blue Hills Ave., Hartford, Conn. 1911.
- §Chamberlain, C. W., 36 Lincoln St., Boston, Mass. 1912.
- \*Chambers, W. Lee, Eagle Rock. 1897 (1919).
- Chapman, Frank M., Amer. Museum Nat. Hist., New York, N. Y. 1903.
- Cheesman, M. R., R.D. 1, Rivera. 1919.
- Cheney, Miss Mary, South Manchester, Conn. 1919.
- \*§Childs, John Lewis, 1904 (1914). Deceased. 1921.
- Clark, Josiah H., 238 Broadway, Patterson, N. J. 1910.
- Clark, Walter, 424 S. Broadway, Santa Ana. 1919.
- Clay, C. Irvin, Box 353, Eureka. 1910.
- Clayburgh, Mrs. Herbert, Redwood City. 1920.
- Clifton, H. T., 509 E. Walnut St., Pasadena. 1904.
- Coale, Henry K., Highland Park, Ill. 1907.
- Coffin, Robert L., Mass. Agr. Exp. Station, Amherst, Mass. 1920.
- Coggins, Herbert L., 2929 Piedmont Ave., Berkeley. 1910.
- Cohen, Donald A., 2618 Lincoln St., Alameda. 1901.
- \*§Colburn, A. E., 806 S. Broadway, Los Angeles. 1905 (1915).
- Compton, Mary J. (Mrs. C. Norman), 6510 1st St. N. E., Seattle, Wash. 1920.
- Comstock, Dr. John, Southwest Museum, Los Angeles. 1920.
- Cook, Fred'k W., 1604 Harrison St., Seattle, Wash. 1919.
- Cooke, Miss M. T., 1328 12th St., Washington, D. C. 1918.
- Cookman, Alfred, 138 S. Pacific Ave., Glendale. 1912.
- Cooley, R. A., Agr. Exp. Sta., Bozeman, Mont. 1921.
- Cooper, J. S., 827 54th St., Oakland. 1903.
- Cope, Francis R., Jr., Dimock, Penn. 1919.
- Cox, H. E., care C. H. Reed Co., San Luis Obispo. 1916.
- Cox, Richard, 3d, 1829 Arch St., Berkeley. 1919.
- Cozens, Harold H., 3071 Bateman St., Berkeley. 1921.
- Crane, Ada Ethel, Box 607, Westwood. 1914.
- Craven, Jesse T., 811 Roosevelt Ave., Detroit, Mich. 1909.
- Crosby, Maunsell S., Grasmere Farms, Rhinebeck, N. Y. 1911.
- Crum, Miss Ethel, Tulare. 1920.
- Culver, Geo. B., Stanford University. 1921.
- Culver, Susan B., 2423 Prospect St., Berkeley. 1914.
- Cummings, Byron, Univ. Ariz., Tucson, Ariz. 1916.
- Cunningham, Walter, 3009 Dunham Ave., Kansas City, Mo. 1921.
- Currier, Ed. S., 416 E. Chicago St., St. Johns Sta., Portland, Ore. 1904.
- \*Daggett, Frank S., 1895 (1919) Deceased. 1920.
- Davenport, Mrs. Elizabeth B., Northern Ave., Brattleboro, Vt. 1911.
- Davidson, Pirie, S. Branch, Univ. Calif., Los Angeles. 1916.
- Davies, A. E., 1327 Grove St., Berkeley. 1920.
- Davis, Benjamin J., 2525 Piedmont Ave., Berkeley. 1916.
- Davis, Dr. Fred B., 401 Vernon St., Oakland. 1916.
- Davis, John M., 737 M St., Eureka. 1908.
- \*Dawson, W. Leon, R.D. 3, Box 83, Santa Barbara. 1906 (1915).
- Day, Chester S., 16 Brown St., Brookline, Mass. 1910.
- Dean, W. F., Three Rivers. 1901.
- Deane, Ruthven, 112 W. Adams St., Chicago, Ill. 1904.
- Deane, Wallace A., 1266 Columbia Road, Washington, D. C. 1919.
- Deane, Walter, 29 Brewster St., Cambridge, Mass. 1907.
- Dearborn, Ned, Sackett Harbor, N. Y. 1909.
- Decker, F. R., Kiona, Wash. 1913.
- DeGroot, Dudley S., Normal Hill Center, Los Angeles. 1916.
- Dice, Dr. Lee R., Museum of Zoology, Ann Arbor, Mich. 1914.
- Dickenson, A. B., 1510 Girard St., Los Angeles. 1916.
- Dickenson, Mrs. A. B., 1510 Girard St., Los Angeles. 1919.
- \*§Dickey, Donald R., San Rafael Heights, Pasadena. 1910 (1916).
- Dille, F. M., Valentine, Neb. 1903.
- Dings, G. M., 2161 Ry. Exch. Bldg., St. Louis, Mo. 1920.
- Disney, Dwight R., Box 278A, Rupert, Idaho. 1920.



- Dixon, Joseph, Museum Vert. Zool., Berkeley. 1904.
- Dodge, Laura I., 3031 Eliot St., Long Beach. 1915.
- Dodge, Ralph E., 225 Pacific Ave., Santa Cruz. 1915.
- Dodge, Mrs. Rowland B., 64 Panoramic Way, Berkeley. 1920.
- Doolittle, E. A., Box 44, Painesville, Ohio. 1918.
- Drachman, Myra, 3031 Eliot St., Long Beach. 1915.
- Drummond, Mrs. Ella B., 2739 Bancroft Way, Berkeley. 1921.
- DuBois, Alexander Dawes, 327 S. Glenwood Ave., Springfield, Ill. 1911.
- Dudley, Mrs. F. A., 432 Geary St., San Francisco. 1921.
- Duprey, H. F., R.D. 1, Box 78B, Dixon. 1907.
- Durfee, Owen, Box 125, Fall River, Mass. 1911.
- Dutton, P. C., High St., Stone Staffs, England. 1913.
- Dwight, Dr. Jonathan, Jr., 43 W. 70th St., New York, N. Y. 1904.
- Easton, Mrs. Jane F., Torrey Road, La Jolla. 1920.
- Eaton, S. Harrison, Box 653, Lawrenceville, Ill. 1916.
- Edson, J. M., Marietta Road, Bellingham, Wash. 1911.
- Edwards, H. Arden, R.D. 1, Box 284, Los Angeles. 1913.
- \*Eggleston, Prof. Julius W., Y. M. C. A., Riverside. 1913 (1919).
- Elmore, L. A., Box 607, Dunsmuir. 1920.
- \*Emerson, W. Otto, Palm Cottage, Hayward. 1920.
- Esterly, Dr. C. O., Occidental College, Los Angeles. 1908.
- Evans, Frank C., Crawfordsville, Ind. 1918.
- Evans, J. Harold, R.D. 4, Box 500, Santa Rosa. 1917.
- Evans, Wm. V., Livingston, Mont. 1920.
- Evermann, Dr. Barton W., Cal. Acad. Sciences, San Francisco. 1911.
- Falger, Annie M. (Mrs. Wm.), Modesto. 1917.
- Fargo, Mrs. Minerva J., 1632 N. Kingsley Drive, Los Angeles. 1914.
- Farnsworth, Dean, 1009 Manning St., Winfield, Kan. 1921.
- Felger, A. H., North Side High School, Denver, Colo. 1920.
- Felton, Mrs. C. N., 105 Summit Ave., Redlands. 1916.
- Ferguson, Elizabeth, 5 Panoramic Way, Berkeley. 1918.
- Ferguson, Mrs. Mary Van E., 5 Panoramic Way, Berkeley. 1915.
- Field, Mrs. Chas. A., 534 27th St., Oakland. 1916.
- Field, Clyde, 1859 Julian Ave., San Diego. 1919.
- Field, Geo. R., Requa, Del Norte Co. 1921.
- Field, Dr. George, 2807 18th St. N. W., Washington, D. C. 1918.
- Finley, Wm. L., 651 E. Madison St., Portland, Ore. 1900.
- Fish, Mrs. Frances Webster, 2325 Piedmont Ave., Berkeley. 1917.
- Fisher, Dr. A. K., Biol. Survey, Washington, D. C. 1904.
- Fisher, Miss Elizabeth W., 2222 Spruce St., Philadelphia, Pa. 1910.
- Fisher, Prof. Walter K., Stanford Marine Laboratory, Pacific Grove. 1900.
- Fitzpatrick, T. J., Bethany, Neb. 1913.
- Fleming, J. H., 267 Rusholme Road, Toronto, Ont., Canada. 1910.
- Fletcher, Lyle R., 353 N. Arch St., Norton, Kan. 1920.
- Flint, Wm. R., 244 N. Madison Ave., Pasadena. 1912.
- Flinn, Catherine Mills, 1799 University Ave., Berkeley. 1920.
- Flynn, Helen, 1546 Shattuck Ave., Berkeley. 1920.
- Forbush, E. H., State House, Boston, Mass. 1916.
- Forrest, Earle R., 205 N. Main St., Washington, Pa. 1910.
- Fortiner, John C., Brawley. 1910.
- Fowler, Frederick H., 221 Kingsley Ave., Palo Alto. 1901.
- Francis, Nathaniel A., 35 Davis Ave., Brookline, Mass. 1920.
- Frank, Arthur, W. Wash. Exp. Sta., Puyallup, Wash. 1920.
- Frazer, J. Thomas, Jr., 432 W. Hawthorne St., Eureka. 1920.
- French, Mrs. A. J., Carlton, Ore. 1921.
- French, James G., The Menagerie, 3628 Saanich Road, Victoria, B. C., Canada. 1918.
- Frye, Prof. T. C., Univ. Wash., Seattle, Wash. 1919.
- Fuertes, Louis A., 201 Wyckoff Ave., Ithaca, N. Y. 1904.
- Furber, John J., Klamath Falls, Ore. 1918.
- Gabrielson, Ira N., 515 P. O. Bldg., Portland, Ore. 1919.
- Ganier, Albert F., 2507 Ashwood Ave., Nashville, Tenn. 1921.
- Gartrell, Geo. N., Summerland, B. C., Canada. 1917.
- Gault, Benj. T., 2313 Washington Blvd., Chicago, Ill. 1905.
- Gay, Harold S., 200 S. Wilson Ave., Alhambra. 1901.
- Geiselhart, Josephine, Concord. 1920.
- Germain, Miss Claire, 3906 W. 1st St., Los Angeles. 1915.
- Giannini, Chas. A., Poland, N. Y. 1919.
- Gifford, Dr. Harold, 420 S. 36th St., Omaha, Neb. 1916.
- Gignoux, Claude, 73 Tunnel Road, Berkeley. 1919.
- Gilchrist, Francis G., 240 Webster St., San Francisco. 1920.
- Giles, Roscoe L., 82 Newton St., Marlborough, Mass. 1917.
- Gilman, M. French, Banning. 1901.
- Girvin, F. H., Brawley Hardware Co., Brawley. 1919.
- Goelitz, Herman, 944 Alameda Drive, Portland, Ore. 1920.
- \*Goelitz, Walter A., 170 Nunda Blvd., Rochester, N. Y. 1915 (1920).
- Goethe, C. M. Capital Natl. Bank Bldg., Sacramento. 1915.
- Goldman, E. A., Biol. Survey, Washington, D. C. 1901.
- Goldman, Luther J., Pendleton, Idaho. 1902.
- Goodcell, Mrs. Marion L., 864 D St., San Bernardino. 1914.
- Goodrich, J. J., R.D. 2, Box 82, Compton. 1920.
- Gormley, A. L., Box 80, Arnprior, Ont., Canada. 1918.
- Gosse, Capt. Philip, Saville Club, 107 Piccadilly W., London, England. 1917.
- Gould, Joseph E., Box 126, Arcadia, Fla. 1909.
- Grant, U. S., 4th, Harvard Club, 27 W. 44th St., New York, N. Y. 1909.
- Granville, Fred L., Box 93, Universal City. 1910.
- Greenleaf, Joseph T., Jr., 602 14th St. N., Seattle, Wash. 1920.
- Grev, Henry, R.D. 2, Box 154A, San Diego. 1901.
- Griffee, Bill, R.D. 3, Box 68, Corvallis, Ore. 1919.
- Griffin, Eva F., 1035 Geary St., San Francisco. 1918.
- Grinnell, Geo. Bird, 238 E. 15th St., New York, N. Y. 1914.
- \*Grinnell, Hilda Wood, 2811 College Ave., Berkeley. 1912 (1921).
- \*Grinnell, Dr. Joseph, Museum Vert. Zool., Berkeley. 1894 (1919).
- Guion, Geo. Seth, Napoleonville, La. 1911.
- Gunn, Miss Amy E., 1342 Filbert St., San Francisco. 1914.
- Gunthorp, Horace, Univ. Wash., Seattle, Wash. 1920.
- Guthrie, Miss Esther, 1326 N St., Sacramento. 1918.

- Hadeler, E. W., Painesville, Ohio. 1918.  
 Hall, Mrs. Carlotta C., 1615 La Loma Ave., Berkeley. 1915.  
 Hall, Mrs. C. H., 512 W. 30th St., Los Angeles. 1921.  
 Halladay, Daniel S., R.D. 3, Box 201, Anaheim. 1910.  
 Hanaford, A. W., R.D. 9, Box 700, Los Angeles. 1917.  
 Hands, Frank H., Dos Cabezas, Ariz. 1920.  
 Hanford, Forrest, 3825 Division St., Oakland. 1912.  
 Hann, H. H., Parkdale, Ore. 1909.  
 Hanna, W. C., 1000 Pennsylvania Ave., Colton. 1902.  
 Harlow, Richard C., 369 Foster Ave., State College, Penn. 1919.  
 Harmon, Mrs. Frances M., 2115 Estrella Ave., Los Angeles. 1912.  
 Harper, Francis, 3101 24th St., N. E., Washington, D. C. 1920.  
 \*Harris, Harry, 18 W. 52d St., Kansas City, Mo. 1914 (1919).  
 Harrison, H. M., 503 Linden St., Camden, N. J. 1920.  
 Hart, Cecil, R.D. 6, Box 432, Los Angeles. 1920.  
 Hartman, Paul J., 1118½ Maple Ave., Los Angeles. 1917.  
 Hathaway, H. S., Box 1466, Providence, R. I. 1912.  
 Havemeyer, Henry O., 129 Front St., New York, N. Y. 1917.  
 Hawkins, Chauncey J., 129 Fairmont St., Lowell, Mass. 1920.  
 Hayes, Mrs. F. M., Box 591, Davis. 1919.  
 \*Hazard, R. G., Peace Dale, R. I. 1909. Deceased, 1918.  
 Head, Anna, 2809 Forest Ave., Berkeley. 1912.  
 Heath, Prof. Harold, 1147 Ramona St., Palo Alto. 1919.  
 Hedges, Chas. F., Box 24, Miles City, Mont. 1919.  
 Hegner, Carl D., 810 Avoca St., Los Angeles. 1914.  
 Heineman, Oluf J., 1664 Grove St., San Francisco. 1908.  
 Heller, Edmund, Amer. Museum Natl. Hist., New York, N. Y. 1894.  
 Helme, Arthur H., Miller Place, Suffolk Co., N. Y. 1911.  
 Henderson, Dr. H. C., Casitas Road, Carpinteria. 1919.  
 Henderson, Junius, 627 Pine St., Boulder, Colo. 1909.  
 Henderson, Walter C., Biol. Survey, Washington, D. C. 1918.  
 Hendren, Miss Elizabeth, Occidental. 1920.  
 Henshaw, Judge F. W., 762 Mills Bldg., San Francisco. 1915.  
 Herschel, Vincent Hibbard, R.D. 1, Box 92A, Tucson, Ariz. 1921.  
 \*Hersey, F. Seymour, 6 Maple Ave., Taunton, Mass. 1915 (1920).  
 Hersey, L. J., Wray, Colo. 1909.  
 Higgins, Elmer, 526 W. 38th St., San Pedro. 1919.  
 Hill, James H., Box 485, New London, Conn. 1919.  
 Hill, Willard, Star Route, Wasco, Kern Co. 1918.  
 Hoffman, Louis E., Box Cor. Benner and Shults St., Los Angeles. 1920.  
 Hoffmann, Ralph, Carpenteria. 1920.  
 Höhfeld, Mrs. Edward, 754 3d Ave., San Francisco. 1920.  
 \*Holland, Harold M., Galesburg, Ill. 1901 (1920).  
 Holleman, Ridley, 205 Duffield St., San Antonio, Texas. 1917.  
 Hollister, N., Nat. Zool. Park, Washington, D. C. 1920.  
 Holman, F. C., 1260 Grove St., San Francisco. 1914.  
 \*Hoover, Theodore J., 450 Melville Ave., Palo Alto. 1898 (1916).  
 Horn, Everett E., 220 P. O. Bldg., Portland, Ore. 1919.  
 Hornung, Dr. John, 5219 Wilton Place, Los Angeles. 1920.  
 Horsfall, R. Bruce, 1457 E. 18th St., Portland, Ore. 1914.  
 Horsfall, Mrs. R. Bruce, 1457 E. 18th St., Portland, Ore. 1916.  
 Howard, O. W., Box 484, Los Angeles. 1895.  
 \*Howell, A. B., 770 S. Pasadena Ave., Pasadena. 1908 (1915).  
 Howell, Arthur H., 2919 S. Dakota Ave., Washington, D. C. 1916.  
 Howell, B. F., Jr., 52 Patton Ave., Princeton, N. J. 1909.  
 Howes, Paul G., 46 Auldwood Road, Stamford, Conn. 1910.  
 Hubbard, S., 244 Montecito Ave., Oakland. 1912.  
 Huber, Wharton, 225 St. Marks Square, Philadelphia, Pa. 1915.  
 Hudson, L. W., Brown Coll., Silvan Springs, Ark. 1917.  
 §Huey, Laurence, Nat. Hist. Museum, Balboa Park, San Diego. 1909.  
 Hungate, J. W., State Normal, Cheney, Wash. 1918.  
 Hunt, C. J., 5847 W. Superior St., Chicago, Ill. 1919.  
 Hunt, Edwin B., 4318 14th St., N. W., Washington, D. C. 1914.  
 Hunt, Richard, Museum Vert. Zool., Berkeley. 1918.  
 Hunter, J. S., Box 482, San Mateo. 1903.  
 Hurley, John B., 225 East E St., Yakima, Wash. 1921.  
 Husher, Mrs. Gertrude H., 821 S. Hope St., Los Angeles. 1913.  
 Hussey, Roland F., Dept. of Animal Biol., Univ. Minn., Minneapolis, Minn. 1916.  
 Hyde, Mrs. Chas. Gilman, 2579 Buena Vista Way, Berkeley. 1921.  
 Illingsworth, J. F., Gordonvale, Cairns, N. Queensland. 1896.  
 Illo, Howard C., 11th and Main Sts., Los Angeles. 1920.  
 Ingersoll, Albert M., 908 F St., San Diego. 1895.  
 Isham, C. Bradley, 27 W. 67th St., New York, N. Y. 1909.  
 Jackson, Hartley H. T., Biol. Survey, Washington, D. C. 1921.  
 Jackson, Ralph W., R.D. 1, Cambridge, Md. 1917.  
 Jackson, Thos. H., 304 N. Franklin St., West Chester, Pa. 1911.  
 Jacobs, J. Warren, 404 S. Washington St., Waynesburg, Pa. 1909.  
 Jacobsen, W. C., 2319 M St., Sacramento. 1916.  
 Jay, Antonin, 1622 Pennsylvania Ave., Los Angeles. 1901.  
 Jenkins, Ida G., 30 Dearborn St., Roxbury, Mass. 1914.  
 Jenks, S. Herbert, 1730 N. Fair Oaks Ave., Pasadena. 1918.  
 Jenney, Chas. F., 100 Gordon Ave., Hyde Park, Mass. 1917.  
 Jessee, Dr. R. L., Philo, Ill. 1909.  
 Jesurun, Dr. Mortimer, 802 American Ave., Long Beach. 1916.  
 Jewett, Stanley G., 582 Bidwell Ave., Portland, Ore. 1909.  
 Job, Herbert K., 601 Washington Ave., West Haven, Conn. 1915.  
 Johnson, A. C., Whittier Nat. Bank, Whittier. 1919.  
 Johnson, Frank Edgar, 16 Amackassin Terrace, Yonkers, N. Y. 1911.  
 Johnson, H. H., Pittsfield, Me. 1920.  
 Johnson, Dr. Myrtle E., National City. 1908.  
 Johnston, Ivan Murray, W. 8th St., Upland. 1920.  
 Johnstone, W. B., Edgewood, B. C., Canada. 1918.  
 Jonas, Coloman, 1023 Broadway, Denver, Colo. 1910.  
 Jones, Dr. Lombard Carter, Falmouth, Mass. 1918.  
 Jones, Dr. Lynds, Museum Oberlin Coll., Oberlin, Ohio. 1911.

- Jordan, A. H. B., Everett, Wash. 1911.  
 Jordan Dr. David Starr, Stanford University. 1902.  
 Joy, Emmet, San Andreas. 1920.  
 Kaeding, Geo. L., Battle Mountain, Nev. 1903.  
 Kell, Delacourt, Claremont. 1921.  
 Kelley, Mrs. Harriet P., 2505 Logan St., Selma. 1917.  
 Kellogg, George Herbert, 2526 Piedmont Ave., Berkeley. 1921.  
 Kellogg, Miss Louise, Box 248, Suisun. 1911.  
 Kellogg, Mildred, 2232 Piedmont Ave., Berkeley. 1921.  
 Kellogg, Ralph T., Silver City, N. M. 1916.  
 Kellogg, Prof. Vernon L., Stanford University. 1901.  
 Kelly, Junea W. (Mrs. G. E.), 1311 Grand St., Alameda. 1918.  
 \*Kennard, Frederick H., Dudley Road, Newton Centre, Mass. 1911 (1916).  
 Kennedy, Clarence H., Zool. Dept. State College, West Raleigh, N. C. 1912.  
 Kennedy, Miss Eveline, 231 E. Ave. 52, Los Angeles. 1921.  
 Kermodé, F., Provincial Museum, Victoria, B. C., Canada. 1911.  
 Keyes, Prof. Chas. R., Mt. Vernon, Iowa. 1900.  
 Kibbe, A. S., 1534 Grove St., Berkeley. 1917.  
 Kibbe, Bessie W. (Mrs. A. S.), 1534 Grove St., Berkeley. 1917.  
 Kimball, H. H., Yuma, Ariz. 1909.  
 King, Albert H., 3612 N. Griffin Ave., Los Angeles. 1920.  
 Kirn, Albert J. B., Electra, Texas. 1918.  
 Kitchin, E. A., 4014 N. 35th St., Tacoma, Wash. 1917.  
 Kitt, W. Stanley, 129 S 5th Ave. Tucson, Ariz. 1921.  
 Kittredge, Joseph, Jr., U. S. Forest Service, Washington, D. C. 1915.  
 Kluegel, Mrs. Edward A., Carmel. 1916.  
 Knickerbocker, Chas. K., 445 N. Sacramento Ave., Carpenter Sta., Chicago, Ill. 1905.  
 Knowlton, Dr. F. H., U. S. Nat. Museum, Washington, D. C. 1910.  
 Kofoid, Prof. C. A., Zool. Dept., Univ. Calif., Berkeley. 1909.  
 Kohler, Louis S., R.D. 2, Paterson, N. J. 1909.  
 Krehbiel, Leonard, Upland. 1919.  
 Kretzman, Prof. P. E., 3705 Texas Ave., St. Louis, Mo. 1914.  
 Kuser, John Dryden, Bernardsville, N. J. 1912.  
 Kuykendall, W. A., Eugene, Ore. 1916.  
 Labarthe, Jules, 85 Second St., San Francisco. 1914.  
 LaJuenesse, H. V., 2517 Webb St., Alameda. 1916.  
 Lamb, Chester C., 1144 E. Adams St., Los Angeles. 1899.  
 Lancashire, Mrs. J. H., 7 E. 75th St., New York, N. Y. 1911.  
 Lander, Bessie M., R.D. 1, Box 106, Strathmore. 1920.  
 Lane, Geo. W., Morgan Hill. 1914.  
 Lano, Albert, 220 E. Lafayette Ave., Fayetteville, Ark. 1920.  
 Lastreto, C. B., 260 California St., San Francisco. 1913.  
 Laubenfels, Max Walker de, 108 S. 5th Ave., La Grange, Ill. 1921.  
 \*§Law, J. Eugene, Museum Vert. Zool., Berkeley. 1900 (1915).  
 \*§Law, Laura Beatty (Mrs. J. E.), Museum Vert. Zool., Berkeley. 1915 (1919).  
 Layne, J. Gregg, 737 S. Spring St., Los Angeles. 1912.  
 Leach, Frank A., 217 Hillside Ave., Piedmont. 1917.  
 Ledig, Ruth A., S. Branch, Univ. Calif., Los Angeles. 1919.  
 Lee, Mrs. Melicent H., El Cajon. 1920.  
 Leggett, Dr. R. M., 411 Gunst Bldg., 323 Geary St., San Francisco. 1918.  
 Lelande, H. J., 337 Copp Bldg., Los Angeles. 1897.  
 Leopold, Aldo, 135 S. 14th St., Albuquerque, N. M. 1916.  
 Leopold, Nathan F., Jr., 4754 Greenwood Ave., Chicago, Ill. 1920.  
 Libby, Miss Gretchen L., La Vina Sanatorium, La Vina. 1911.  
 Lien, Carl, Clallam Bay, Wash. 1917.  
 Ligon, J. Stokley, Box 131, Albuquerque, N. M. 1914.  
 Lillencrantz, H. T., Rancho Las Cimas, Hollister. 1916.  
 Lindsay, Dr. D. Moore, 808 Boston Bldg., Salt Lake City, Utah. 1915.  
 §Little, Luther, 1403 Garfield Ave., S. Pasadena. 1914.  
 Littlejohn, Chase, 1226 Warren St., Redwood City. 1901.  
 Livesey, Alice Rose, 373 W. California St., Glendale. 1921.  
 Lombardi, Mrs. M. E., 2249 Piedmont Ave., Berkeley. 1916.  
 Long, Dr. Frances Louise, 1048 N. 2d Ave., Tucson, Ariz. 1921.  
 Loomis, Leverett M., Calif. Acad. Sciences, San Francisco. 1902.  
 Loring, J. Alden, Owego, Tioga Co., N. Y. 1914.  
 §Love, Guy, R.D. 1, El Cajon. 1913.  
 Lusk, R. D., Summerhaven, Tucson, Ariz. 1915.  
 Luther, Clarence H., 8 McElroy Bldg., Fayetteville, Ark. 1909.  
 Lyon, Ray B., Box 186, Paso Robles. 1920.  
 McAtee, W. L., Biol. Survey, Washington, D. C. 1907.  
 McDuff, Esther, 555 Union Ave., San Bernardino. 1919.  
 McGettigan, Carroll, 2644 Filbert St., San Francisco. 1921.  
 \*McGregor, R. C., Bureau of Science, Manila, P. I. 1893 (1916).  
 McGrew, Albert D., 5611 Stanton Ave., Pittsburgh, Pa. 1920.  
 McKibben, J. W., 2522 Piedmont Ave., Berkeley. 1921.  
 McLain, R. B., Box 132, Hollywood. 1897.  
 McLean, Donald D., Coulterville. 1916.  
 McLellan, Antonio, 309 San Francisco St., El Paso, Tex. 1920.  
 McLellan, Miss Mary E., 2935 Pine St., Berkeley. 1919.  
 McMullen, Turner E., 551 Bailey St., Camden, N. J. 1920.  
 Mackay, Miss Susan H., 2214 Dana St., Berkeley. 1920.  
 Madison, Harold L., Park Museum, Providence, R. I. 1917.  
 Magee, William A., Jr., R.D. Fruitvale, Box 433, Oakland. 1912.  
 Mailliard, Ernest C., Federal Reserve Bank, San Francisco. 1909.  
 Mailliard, John W., 230 California St., San Francisco. 1894.  
 \*Mailliard, Joseph, 1815 Vallejo St., San Francisco. 1895 (1920).  
 Marshall, Dr. Benj. M., 2036 D St., Eureka. 1913.  
 Marshall, Perry R. F., 1495 West Adams St., Los Angeles. 1921.  
 Martin, Mrs. Bertha Davis, 1644 Maltman Ave., Los Angeles. 1920.  
 Martin, De Loach, 1223 S. Washington Ave., Marshall, Texas. 1916.  
 Massey, Herbert, Ivy Lea, Burnage, Didsbury, Manchester, England. 1909.  
 Maxson, Asa C., Longmont, Colo. 1920.  
 Mead, Mrs. Edwin B., 2618 Etna St., Berkeley. 1920.  
 Meade, Grace S. (Mrs. Calvert), Box 161, Carmel. 1916.  
 Meadows, Donald C., Smiley Hall, Claremont. 1919.  
 Meeker, Jesse C. A., Box 161, Danbury, Conn. 1907.  
 Meister, H. D., Wauseon, Ohio. 1909.  
 Mercer, John D., 104 W. 1st St., Los Angeles. 1918.  
 \*§Mershon, W. B., Saginaw, Mich. 1911 (1919).  
 Meyer, Miss Heloise, Overlee, Lenox, Mass. 1914.  
 Meyers, Harold E., Medina, N. Y. 1920.  
 Michael, Chas. W., Yosemite. 1916.

- Middleton, R. J., Jeffersonville, Pa. 1918.  
 Miller, Mrs. E. C. T., 1010 Euclid Ave., Cleveland, Ohio. 1914.  
 Miller, Dr. Loye, S. Branch, Univ. Calif., Los Angeles. 1905.  
 Miller, Mary Mann, 5928 Hayes Ave., Los Angeles. 1920.  
 Miller, W. De Witt, Amer. Museum Nat. Hist., New York, N. Y. 1909.  
 §Mills, Enos A., Longs Peak, Estes Park, Colo. 1914.  
 Miner, Dr. H. N., Penryn. 1903.  
 §Mitchell, H. H., Prov. Museum, Normal School, Regina, Sask., Canada. 1915.  
 Mitchell, Dr. Walton I., Paonia, Delta Co., Colo. 1909.  
 Moffitt, James, 1818 Broadway, San Francisco. 1917.  
 Moore, Miss Nellie, 122 Falcon Ave., Long Beach. 1915.  
 Moore, Raymond W., 441 Emerson St., Palo Alto. 1919.  
 Moore, Robert T., 46 Mansion Ave., Haddonfield, N. J. 1911.  
 Moore, Wm. Warren, 1431 9th St., Eureka. 1921.  
 Moran, R. B., 1318 S. Gramercy Place, Los Angeles. 1897.  
 \*§Morcom, G. Freaan, 243 N. Coronado St., Los Angeles. 1904 (1915).  
 More, R. L., Vernon, Texas. 1911.  
 Morley, S. Griswold, 2535 Etna St., Berkeley. 1916.  
 Mueller, Carl, Marysville. 1911.  
 Mullen, James L., 1264 Logan Ave., Salt Lake City, Utah. 1915.  
 Munro, J. A., Okanagan Landing, B. C., Canada. 1914.  
 Murie, Olaus J., 219 7th Ave. S., Moorehead, Minn. 1913.  
 Musgrave, Ethel Weatherford (Mrs. M. F.), Box 765, Phoenix, Ariz. 1921.  
 Myers, Mrs. H. W., 311 N. Ave. 66, Los Angeles. 1912.  
 \*Nace, C. A., 171 W. Santa Clara St., San Jose. 1920 (1920).  
 Neff, Johnson A., Marionville, Mo. 1920.  
 Neilson, Mrs. Katherine, 1419 Versailles St., Alameda. 1920.  
 Neugass, Mrs. Merwyn, 2597 Buena Vista, Berkeley. 1920.  
 Newhall, Mrs. Chas. S., 2629 Piedmont Ave., Berkeley. 1916.  
 Nice, Mrs. Margaret Morse, Norman, Okla. 1921.  
 Nichols, J. T., Amer. Museum Nat. Hist., New York, N. Y. 1909.  
 Nicholson, Donald J., Orlando, Fla. 1911.  
 Nicholson, Gordon W., 7th St., Ontario. 1919.  
 Nicholson, Helen S., Box 46, Univ. Sta., Tucson, Ariz. 1921.  
 Noack, H. R., 309 Perry St., Oakland. 1901.  
 Nokes, Dr. I. D., 1120 Marsh-Strong Bldg., Los Angeles. 1914.  
 Norris, Joseph Parker, Jr., 2122 Pine St., Philadelphia, Pa. 1911.  
 Norris; Roy, 725 N. 10th St., Richmond, Ind. 1911.  
 Norton, Arthur H., 22 Elm St., Portland, Me. 1918.  
 Oberholser, Dr. Harry C., 2805 18th St., N. W., Washington, D. C. 1904.  
 O'Connell, John, 425 New Call Bldg., San Francisco. 1919.  
 O'Farrell, Mrs. Mabel E., 2403 F St., San Diego. 1917.  
 Ohl, H. C., McKittrick. 1913.  
 Ohlendorf, W. C., 320 E. Stewart Ave., Park Ridge, Ill. 1910.  
 Osencup, Claten, 1267 Sunset Ave., Pasadena. 1917.  
 Osgood, Dr. Wilfred H., Field Museum Nat. Hist., Chicago, Ill. 1893.  
 Osterhout, Geo. E., Windsor, Colo. 1915.  
 Overholtzer, John E., 6 W. Main St., Morristown, Pa. 1920.  
 Overington, R. Bruce, 220 Golden Gate, San Francisco. 1920.  
 Owen, Virgil W., 832 Beacon St., Los Angeles. 1896.  
 Palmer, Miss Elizabeth Day, 1741 Harvard Blvd., Los Angeles. 1909.  
 Palmer, R. H., Geol. Dept., Univ. Wash., Seattle, Wash. 1915.  
 \*Palmer, Dr. T. S., 1939 Biltmore St., N. W., Washington, D. C. 1903 (1920).  
 Pangburn, Clifford H., Bethayres, Pa. 1920.  
 Parcell, Miss Zulema L., 826 S. Beacon St., Los Angeles. 1919.  
 Parker, Herbert, South Lancaster, Mass. 1911.  
 Parks, H. O., Willcox, Ariz. 1919.  
 Parmenter, Henry E., 526 E. Valerio St., Santa Barbara. 1916.  
 Paroni, Clelia A., 2430 Bancroft Way, Berkeley. 1920.  
 Parsons, Mrs. Marion Randall, 27 Mosswood Road, Berkeley. 1917.  
 Paul, J. H., 1320 E. 2d St. South, Salt Lake City, Utah. 1915.  
 Paul, Lucius H., 436 Carter St., Rochester, N. Y. 1911.  
 Peabody, Rev. P. B., Blue Rapids, Kan. 1904.  
 Pearson, T. Gilbert, 1974 Broadway, New York, N. Y. 1910.  
 Peck, Miss L. M., 1510 Girard St., Los Angeles. 1919.  
 Peck, Morton E., 244 N. 12th St., Salem, Ore. 1909.  
 Pemberton, J. R., Box 1112, Tulsa, Okla. 1900.  
 Pennock, Chas. J., Kennett Square, Philadelphia, Pa. 1909.  
 Peyton, Lawrence, R.D. 2, Fillmore. 1909.  
 Peyton, Sidney B., Sespe. 1913.  
 Phelps, Frank M., 212 E. 4th St., Elyria, Ohio. 1912.  
 \*§Phillipp, Philip Bernard, 220 Broadway, New York, N. Y. 1911 (1920).  
 Phillips, C. L., 5 W. Weir St., Taunton, Mass. 1915.  
 §Phillips, John C., Knobfields, Wenham, Mass. 1911.  
 \*Pierce, Wright M., Box 116, Claremont. 1902 (1919).  
 Pierpont, Philip, Nordhoff. 1913.  
 Pillsbury, Frank O., 1088 Main St., Walpole, Mass. 1911.  
 Pitcher, Mrs. E. C., R.D. I, Box 273, Hayward. 1920.  
 Pleasants, Mrs. J. E., R.D. 3, Orange. 1900.  
 Pope, E. F., El Reno, Okla. 1913.  
 Potter, Miss Carolyn B., 1314 Alice St., Oakland. 1920.  
 Powell, Miss Helen, 2703 Dwight Way, Berkeley. 1914.  
 Fowell, R. A., 475 Broadway, Fresno. 1920.  
 Pratt, Helen S., 245 W. Ridgway, Eagle Rock. 1920.  
 Price, A. E., Grant Park, Ill. 1905.  
 Price, Mrs. Ernest B., 108 Bonita Ave., Piedmont. 1920.  
 Prill, Dr. A. G., Scio, Ore. 1921.  
 \*Pringle, Miss Cornelia Covington, 1705 Gough St., San Francisco. 1915.  
 Purdy, William B., Milford, Mich. 1921.  
 Purington, Mrs. C. A., 1225 E. 3d St., Long Beach. 1915.  
 Quillin, Roy W., 1025 Summit Ave., San Antonio, Texas. 1921.  
 Racey, Kenneth, 3262 1st Ave. W., Vancouver, B. C. 1921.  
 Raker, Mary E., 1484 E. Sherman St., Portland, Ore. 1919.  
 Randolph, Miss Flora A., 2962 Derby St., Berkeley. 1907.  
 Rankin, Edward P., care Miss O'Conner, San Lorenzo. 1913.  
 Ransom, Webster H., 708 W. 20th Ave., Spokane, Wash. 1921.  
 Rathbun, S. F., 305 Marion Bldg., Seattle, Wash. 1904.  
 Rawson, Charles I., Oxford, Mass. 1918.  
 Ray, Milton S., 29 Spear St., San Francisco. 1899.  
 Reid, Russell, Bismark, N. Dak. 1921.  
 Reis, C. Oscar, Roosevelt. 1917.  
 Reygadas, Ynes Mexia de, 401 Medical Bldg., San Francisco. 1921.  
 Reynolds, L. R., 124 Park St., Brockton, Mass. 1913.

- Reynolds, Nephi, Wn. Arms and Sp't'g Goods Co., Salt Lake City, Utah. 1919.
- Rich, Dr. Guy C., 1820 El Cerrito Place, Hollywood. 1911.
- Rich, Selwyn, Box 55, Claremont. 1919.
- Rich, Waldo L., Saratoga Springs, N. Y. 1919.
- Richards, E. B., 128 Chester St., Grass Valley. 1909.
- Richards, Dr. T. W., Naval Hospital, Annapolis, Md. 1908.
- Richards, W. W., 1512 Broadway, Oakland. 1915.
- Richardson, W. D., 4215 Prairie Ave., Chicago, Ill. 1918.
- Richey, J. Howard, 261 W. Dakota St., Pasadena. 1914.
- Richmond, Dr. Chas. W., U. S. Nat. Museum, Washington, D. C. 1904.
- Richmond, Frank, care Richmond Bros., El Centro. 1920.
- Rickard, John Forbes, 250 Tunnel Road, Berkeley. 1921.
- Rigdon, Dr. R. L., 1617 Broderick St., San Francisco. 1921.
- Riley, J. H., U. S. Nat. Museum, Washington, D. C. 1909.
- Rittenhouse, Prof. Samuel, Univ. S. Cal., Los Angeles. 1916.
- Ritter, Prof. W. E., LaJolla. 1901.
- Robbins, Reginald C., Hot Springs Ave., Santa Barbara. 1921.
- Roberts, Dr. T. S., Zoological Museum, Univ. Minn., Minneapolis, Minn. 1909.
- Robertson, Howard, 157 Wilton Drive, Los Angeles. 1896.
- §Robertson, John McB., R.D. 1, Box 13, Buena Park, Orange Co. 1913.
- Robertson, Mrs. John McB., Buena Park. 1920.
- Roe, Mrs. E. D., 744 Guerro St., San Francisco. 1919.
- Roe, Mrs. Georgianna T., 2523 Hillegass Ave., Berkeley. 1921.
- Ross, Ronald C., 1921 Kirkwood Ave., Pasadena. 1920.
- Rowan, Wm., Dept. Zool., Univ. Alberta, Edmonton, Alta., Canada. 1921.
- Rowley, J., 42 Plaza Drive, Berkeley. 1909.
- Rush, Lora Gertrude, 1607 Walnut St., Berkeley. 1920.
- Rust, Henry J., Box 683, Coeur d'Alene, Idaho. 1911.
- Sage, Jno. H., Portland, Conn. 1910.
- Sampson, W. B., 1005 N. San Joaquin St., Stockton. 1894.
- Sanford, Dr. Leonard C., 347 Temple St., New Haven, Conn. 1915.
- Sanford, W. H., 919 W. Acacia St., Stockton. 1915.
- Saunders, Aretas A., 48 Longview Ave., Fairfield, Conn. 1909.
- Saunders, W. E., London, Ont., Canada. 1910.
- Saville, Miss Elsie M., 403 E. 8th St., Topeka, Kan. 1920.
- Schaefer, Oscar F., 669 Genesee St., Rochester, N. Y. 1917.
- Schleichert, Ernest K., Mathias Point, Va. 1919.
- Schlesinger, Mrs. Jane L., 1417 Filbert St., Oakland. 1915.
- Schneider, Fred A., 646 Emory St., San Jose. 1901.
- §Schneider, J. J., Box 363, Anaheim. 1899.
- Schussler, Geo. W., 1345 Oak St., San Francisco. 1911.
- Sclater, William Lutley, 10 Sloane Court, London, S. W., England. 1909.
- Scott, Carroll DeWilton, 1620 7th St., San Diego. 1915.
- Sharp, Clarence S., Escondido. 1902.
- Sharples, Robert P., West Chester, Pa. 1911.
- Shaw, Prof. W. T., 1000 Thatuna St., Pullman, Wash. 1911.
- Shelton, Alfred C., Johnston-Shelton Co., Dayton, Ohio. 1909.
- Shepard, John Alden, Route A, Morgan Hill. 1919.
- Shepherd, A. R., 457 W. Burchett St., Glendale. 1920.
- Shepherd, Hattie E., R.D. 1, Box 73, Redlands. 1920.
- \*Sherman, Althea R., National, via McGregor, Iowa. 1911 (1916).
- Shiras, George, 3d, Stoneleigh Court, Washington, D. C. 1914.
- Shupee, George C., Box 964, San Antonio, Texas. 1920.
- Silliman, Edmund, Alisal and Ryker Sts., Salinas. 1918.
- Silliman, O. P., 220 Salinas St., Salinas. 1913.
- Simmons, George F., 701 Holman Ave., Houston, Texas. 1913.
- Sismey, E. D., Box 222, Penticton, B. C., Canada. 1919.
- \*Skinner, M. P., Yellowstone Park, Wyo. 1915 (1920).
- Sloanaker, Jos. L., 907 W. Mansfield Ave., Spokane, Wash. 1910.
- Smith, Allyn G., 1508 Arch St., Berkeley. 1909.
- Smith, Austin Paul, 2043 E. 71st St., Cleveland, Ohio. 1907.
- Smith, A. Russell, Mt. Carmel Ave., North Glenside, Penn. 1919.
- Smith, C. R., 563 42d Ave., San Francisco. 1917.
- Smith, Prof. Frank, 1005 W. California Ave., Urbana, Ill. 1911.
- Smith, Franklin J., Box 98, Eureka. 1913.
- Smith, Horace G., 2918 Lafayette St., Denver, Colo. 1914.
- Smith, L. E., Box 115, Sisson. 1919.
- Smyth, W. H., Fernwald, head of Dwight Way, Berkeley. 1918.
- Smyth, Mrs. W. H., Fernwald, head of Dwight Way, Berkeley. 1918.
- Snyder, Prof. J. O., Box 775, Stanford University. 1900.
- Spaulding, M. Herrick, Agr. Coll., Bozeman, Mont. 1918.
- Springer, Charles, Cimarron, N. Mex. 1920.
- Stacey, John William, 634 Powell St., San Francisco. 1920.
- Stafford, Walter A., 31 Park Way, Piedmont. 1917.
- Steinbeck, William, 1029 N. Hunter St., Stockton. 1897.
- Steinmetz, Frank J., 1021 Ramona St., Palo Alto. 1917.
- Stephens, T. C., Morningside College, Sioux City, Iowa. 1914.
- Stevens, Dr. J. F., 304 Funke Bldg., Lincoln, Neb. 1911.
- Stewart, Ronald M., Comox, B. C., Canada. 1920.
- Still, Donald, 63371 Tyndall Ave., Tucson, Ariz. 1918.
- Stivers, Dr. C. G., 406 Auditorium Bldg., Los Angeles. 1914.
- Stoddard, H. L., Public Museum, Milwaukee, Wis. 1914.
- Stone, D. D., R.D. 1, Casa Grande, Ariz. 1909.
- Stone, Geo. E., 1725 Le Roy Ave., Berkeley. 1912.
- Stoner, Emerson A., Box 444, Benicia. 1918.
- Storer, Miss Mary S., 467 San Pablo Ave., Fresno. 1914.
- Storer, Tracy I., Museum Vert. Zool., Berkeley. 1910.
- Stormont, W. P., 219 W. Ave. 51, Los Angeles. 1917.
- Stout, Gardner D., 129 E. 55th St., New York, N. Y. 1918.
- Streator, Clark P., 16 Mason St., Santa Cruz. 1919.
- \*§Strong, W. A., 41 Grand Ave., San Jose. 1912 (1920).
- Strong, Wm. Duncan, 2522 Ridge Road, Berkeley. 1921.
- Stuart, Geo. H., 3d, N. W. cor. Broad & Chestnut Sts., Philadelphia, Pa. 1913.
- Sugden, J. W., 47 S. 8th W. St., Salt Lake City, Utah. 1915.
- Suits, Clarence L., 149 Fairmont Ave., Eagle Rock. 1920.
- Swales, B. H., U. S. Nat. Museum, Washington, D. C. 1906.
- Swarth, Harry S., Museum Vert. Zool., Berkeley. 1897.

- Sweeney, Joseph A., U. S. Forest Service, Nenzel, Neb. 1912.
- Swenk, Prof. Myron Harmon, 1410 N. 37th St., Lincoln, Neb. 1916.
- Swezy, Dr. Olive, Zool. Dept., Univ. Cal., Berkeley. 1914.
- Tanner, V. M., Dixie Normal Coll., St. George, Utah. 1919.
- Taverner, P. A., Zool. Div., Geol. Survey, Ottawa, Ont., Canada. 1909.
- Taylor, E. F., Grass Valley, Nevada Co. 1910.
- Taylor, Mrs. H. J., 1711 Douglas St., Sioux City, Iowa. 1920.
- Taylor, Jesse H., 210 Myrtle Ave., Eagle Rock. 1919.
- Taylor, L. E., R.D. 2, Reno, Nev. 1897.
- Taylor, Lionel V., Kelowna, B. C., Canada. 1921.
- Taylor, Dr. Walter P., Biol. Sta., La Jolla. 1905.
- Terrill, L. McL., 44 Stanley Ave., St. Lambert, Que., Canada. 1911.
- Terry, Mrs. Anne B., 935 S. Union Ave., Los Angeles. 1920.
- Test, Dr. Louis A., 629 Russell St., Lafayette, Ind. 1903.
- \*Thayer, John E., Box 98, Lancaster, Mass. 1906 (1914).
- Thompson, J. Walcott, 527 E. 1st South St., Salt Lake City, Utah. 1918.
- Thompson, Thos. E., 818 W. Adams St., Los Angeles. 1919.
- Thomson, Miss Isabel A., 5939 Shafter Ave., Oakland. 1918.
- Thowless, Herbert L., 255 Fourth St., Newark, N. J. 1919.
- Tindall, Charles W., 912 N. Noland St., Independence, Mo. 1920.
- Todd, W. E. Clyde, Carnegie Museum, Pittsburgh, Pa. 1909.
- Tonkin, George, Biol. Survey, Boise, Idaho. 1920.
- Treganza, A. O., 522 S. 13th St. E., Salt Lake City, Utah. 1907.
- Treganza, Mrs. A. O., 522 S. 13th St. E., Salt Lake City, Utah. 1915.
- Trenor, T., Box 2, Sta C., Los Angeles. 1913.
- Trescot, E. B., R.D. 4, Box 221, Petaluma. 1915.
- Trippe, Thomas M., Howardsville, Colo. 1911.
- Trumbull, J. H., 39 Farmington Ave., Plainville, Conn. 1911.
- \*Tyler, John G., P. O. Box 173, Fresno. 1905 (1920).
- Tyler, Dr. Winsor M., 522 Massachusetts Ave., Lexington, Mass. 1914.
- Ufford, Elmer, Box 92, Dresden, Kan. 1917.
- Unglish, W. E., Gilroy. 1910.
- Van Denburgh, Dr. John, 240 Stockton St., San Francisco. 1916.
- Van Dyke, Mary Ames, 1545 Le Roy Ave., Berkeley. 1920.
- Van Fleet, Clark C., Box 468, Santa Rosa. 1906.
- \*Van Rossem, Adriaan, 3459 S. Arlington St., Los Angeles. 1909.
- \*Van Straaten, H., Het Veldhuis, 8 Dennerweg, Velp, Holland. 1913 (1919).
- Vorhies, Chas. T., Univ. Ariz., Tucson, Ariz. 1916.
- Walker, Alex., Blaine, Ore. 1911.
- Walker, Ernest P., 1312 E. Filmore St., Phoenix, Ariz. 1910.
- Walker, G. Raymond, R.D. 3, Murry, Utah. 1919.
- Wall, Edward, Box 554, San Bernardino. 1913.
- Warburton, Stanton, Jr., 311 Fidelity Bldg., Tacoma, Wash. 1917.
- Ward, F. H., 18 Grove Place, Rochester, N. Y. 1915.
- Warner, Charles A., 1310 Baker-Detwiler Bldg., Los Angeles. 1920.
- Warner, Mrs. Edna R., 2549 Beechwood Drive, Los Angeles. 1921.
- Warren, E. R., 1511 Wood Ave., Colorado Springs, Colo. 1909.
- Waterhouse, John Thomas, care Alexander and Baldwin, Ltd., Honolulu, T. H. 1921.
- Wear, Miss Winifred N., 253 Coast Ave., Fresno. 1909.
- Weber, J. A., Moore and Grand Aves., Leonia, N. J. 1915.
- Webster, Mrs. Jennie E. B., Univ. Soc., 44 E. 23d St., New York, N. Y. 1918.
- Wegeforth, Dr. Harry M., 210 Maple St., San Diego. 1920.
- Weiser, Charles S., 105 W. Springettsbury Ave., York, Penn. 1920.
- Welch, L. W., 1845 Olive Ave., Long Beach. 1911.
- Wells, Gurnie, 913 4th St. Santa Rosa. 1911.
- Welsh, Joseph, Pasadena Hdw. Co., Pasadena. 1917.
- West, Dr. F. D., Beaumont. 1921.
- Westerfeld, Dr. Otto, 240 Stockton St., San Francisco. 1915.
- Wetmore, Dr. Alexander, Biol. Survey, Washington, D. C. 1909.
- Whalen, Mrs. Etta L., Box 640, Tulsa, Okla. 1914.
- Wheeler, Harry Edgar, Fayetteville, Ark. 1919.
- Wheeler, Mrs. J. W., 403 15th Ave. N., Seattle, Wash. 1912.
- Wheeler, Roswell S., 166 Athol Ave., Oakland. 1894.
- White, Halsted G., 1508 Oxford St., Berkeley. 1914.
- Whitney, Miss Magaret W., 1563 N. Raymond Ave., Pasadena. 1919.
- Widmann, O., 5105 Enright Ave., St. Louis, Mo. 1904.
- Wiggins, Dr. C. G., 1191 N. 9th St., Colton. 1916.
- Wilcox, Mrs. Lydia, 10 Latona St., San Francisco. 1921.
- Wilder, H. E., Carlotta, Humboldt Co. 1909.
- Willard, B. G., 1619 Massachusetts Ave., Cambridge, Mass. 1910.
- Willard, F. C., Farmingdale, Long Island, N. Y. 1905.
- Willett, Geo., Craig, Alaska. 1905.
- Williams, John, R.D. 9, Iowa City, Iowa. 1918.
- Williams, R. F., 218 Inwood Ave., Upper Montclair, N. J. 1919.
- Williams, Robert W., Tallahassee, Fla. 1914.
- Wilson, J. Frank, 512 E. Lemon St., Monrovia. 1915.
- Winson, J. W., Huntingdon, B. C., Canada. 1921.
- Wonser, Mrs. Katherine A., 4102 Brooklyn Ave., Seattle, Wash. 1920.
- Wood, Dr. Casey A., 7 West Madison St., Chicago, Ill. 1916.
- Wood, Dale T., 1470 E. Wilson Ave., Glendale. 1921.
- Wood, Jesse J., 330 W. Micheltoreno St., Santa Barbara. 1912.
- Wood, Norman A., Museum Zool., Ann Arbor, Mich. 1916.
- Woodruff, Frank M., Chicago Acad. Sciences. Chicago, Ill. 1906.
- Woodruff, Regina, Zool. Dept., Univ. Calif., Berkeley. 1920.
- Woods, Robert S., 919 S. Bonnie Brae, Los Angeles. 1920.
- Woodward, C. H., 4129 Ingalls St., San Diego. 1920.
- Wright, Curtis, Jr., 81 Hillcrest, Berkeley. 1916.
- \*Wright, Frank S., 14 Cayuga St., Auburn, N. Y. 1910.
- Wright, Howard W., 830 N. Orange Grove Ave., Pasadena. 1921.
- Wueste, Rudolph, Lower Otay Dam, Bonita. 1901.
- \*Wyman, L. E., Museum Hist., Sci., and Art. Los Angeles. 1908 (1920).
- Wythe, Margaret W., Museum Vert. Zool., Berkeley. 1912.
- Young, Pauline Rodgers, Canille, Santa Cruz Co., Ariz. 1918.
- Zahn, Otto J., 2115 Estrella Ave., Los Angeles. 1896.
- Zech, Miss Lillian, 335 W. Highland Ave., Redlands. 1916.
- Zerlang, John, Rolph, Humboldt Co. 1918.
- Zerlang, Lawrence, 524 W. Hawthorne St., Eureka. 1918.

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National Museum

# THE CONDOR

A Magazine of Western  
Ornithology



Volume XXIII

July-August, 1921

Number 4



W.K.F.

COOPER ORNITHOLOGICAL CLUB

# THE CONDOR

A Magazine of Western Ornithology  
Published Bi-Monthly by the Cooper Ornithological Club

Entered as second-class matter November 29, 1919, at the post-office at Berkeley, California, under Act of Congress of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized January 5, 1921.

Issued from the Office of THE CONDOR, Museum of Vertebrate Zoology, Berkeley, California

## SUBSCRIPTION RATES

Two Dollars per Year in the United States, payable in advance.

Forty Cents the single copy.

Two Dollars and Twenty-five Cents per Year in all other countries in the International Postal Union.

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Two Dollars per year for members residing in the United States.

Two Dollars and Twenty-five Cents in all other countries.

Manuscripts for publication, and Books and Papers for Review, should be sent to the Editor, J. GRINNELL, Museum of Vertebrate Zoology, University of California, Berkeley, California.

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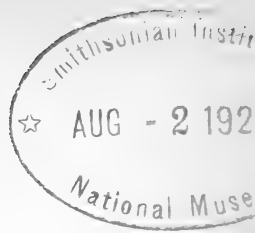
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Issued July 26, 1921

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# THE CONDOR

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## THE STORAGE OF ACORNS BY THE CALIFORNIA WOODPECKER

By HENRY W. HENSHAW

WITH ONE PHOTO

**Y**EARS AGO when I first visited California my attention was attracted by the antics and behavior of the "carpintero", or California Woodpecker as it is more widely known, and I looked hopefully forward to the time when I should have the opportunity to carefully study the habits of this the most remarkable of our woodpeckers. The looked for opportunity, however, never came, and all I can hope to do at the present time is to add a few desultory notes and gleanings to the very suggestive and interesting account of the storage habits of the bird by Dr. Ritter in *THE CONDOR* for January, 1921.

Before adverting to the subject proper a few words may be devoted to the general subject of food storing in the animal world by way of comparison with the well known habits of our woodpecker. The storing of food in times of plenty against the hour of need would seem to be a procedure so natural that one can but wonder that it is not more common among animals, especially when we find the habit so well developed in an order as low as the insects. Whole groups of these, as the ants, bees, and wasps, have acquired the practice, and have devised many curious ways, not only of storing food for themselves, but of providing sustenance for their offspring yet unborn.

Passing at a jump from the lower orders to the higher we find that not a few members of the rodent family, the largest of the order, rely upon stored food for their existence a part of the year, and by their thrift and foresight are thus enabled to inhabit regions where otherwise they could not exist. Many of them, however, substitute the practice of aestivation and hibernation to carry them past the seasons of drought and cold, certain of the western ground squirrels and the well known woodchuck of weather-wise fame furnishing examples.

The perishable nature of their food forbids the carnivorous mammals from storing supplies, though we catch a glimpse of the practice in certain of them, as the lion and other cats, which often hide their partly devoured kills with intent to return to them later for further meals.

Turning now to the highly organized group of birds, but one remove from the mammals, we find that very few have developed the storage habit, even to a slight degree, and that most birds are dependent for food upon their daily

toil. The majority of them, indeed, lead a "hand to mouth" existence and spend most of their waking hours in the never ending quest for sustenance for themselves and their offspring. In the cold and temperate zones, when the food supply begins to fail, most of them depart for regions where food is plenty and never failing. In their constant struggle for life their wings confer upon birds a great advantage over their less mobile cousins, and it is of interest to note that the bats, the only family of mammals that has developed the power of flight to the point that vies with birds, has also adopted the habit of migration, and, with rare exceptions, the several species leave the colder regions for more tropical ones.

The most conspicuous example among birds of a food storer is the California Woodpecker, under which name for the purposes of this paper are included the "Ant-eating Woodpecker" of our southern border and Mexico, and the "Narrow-fronted Woodpecker" of Lower California. All these are but subspecies of *Melanerpes formicivorus*.

In early November of 1884, while conducting linguistic researches among the California Indians, I visited the town of Los Alamos, having found there an old Indian who formerly lived on Santa Rosa Island, and who was one of the last survivors of his tribe, if not the last. My daily walks morning and afternoon to where he lived on the outskirts of the town carried me through a grove of scattered oaks, and here I had an excellent, though brief, opportunity to observe a colony of woodpeckers storing away acorns in holes already drilled in the dead branches of the oaks.

Here for the first and only time I saw the birds pick up pebbles from the ground, and insert them in the holes as a substitute for acorns. This apparently nonsensical departure from the acorn storing habit is by no means entirely devoid of significance, and forms an interesting example of a useful habit gone wrong. The explanation of the substitution of pebbles for acorns seemed to me at the time to be simple enough; nor do I see any present reason to change my view. California is remarkably well supplied with oaks, and the valleys, foothills, and mountains each have their own species. Nevertheless not every year is an acorn year, and some seasons the supply of mast is very small indeed, or altogether wanting. It chanced that there was a very poor crop that year about Los Alamos, and, acorns being for the most part wanting, the birds took the readiest substitute. The storage habit developed through thousands of years has now become imperative, and, as the birds have to store something in the holes already suggestively prepared, they take the most convenient substitute, quite oblivious of the fact that the stones have no food value nor, indeed, any value whatever to the storer, except that arising from the pleasure of storing them, which will be adverted to later. Probably not many stones are thus laid away as compared to the number of acorns, but, as the birds have no further interest in them, they remain where placed till in the lapse of years they weather out and fall to the ground.

The practice of storing stones in the holes dug for the reception of acorns is by no means a local one. Other observers, as quoted by Dr. Ritter, have noted the habit in widely separated localities, both in our own territory and Mexico. Thus C. R. Orcutt contributed to *Science* of March 14, 1884, a note stating that 75 miles south of the boundary, in Mexico, at an altitude of 6000 feet, he observed "the bark of pines perforated with holes" in about one-third

of which were acorns; in the rest were bits of granite gravel of size corresponding with the acorns in the other holes. This was unmistakably the work of our woodpecker, and the unusual percentage of stones would seem to indicate either the work of years or to point to several recent bad acorn seasons.

It is interesting to note that the habit of this woodpecker of storing food is not confined to the temperate zone but accompanies the species to its tropical habitat where food abounds and there would seem to be no adequate reason for it. Thus it is stated in the Proceedings of the Zoological Society (p. 14, 1876), that Mr. O. Salvin exhibited and made remarks on the section of the trunk of a pine from Guatemala perforated by a woodpecker (*Melanerpes formicivorus*) "for the purpose of storing acorns".

De Saussure\* also states that in the desert near Cafre de Perote, Vera Cruz, Mexico, *Colaptes cafer* [Red-shafted Woodpecker] bores holes into dead agave stalks through which it inserts acorns into the hollow interior of the stalk. The birds begin the holes near the bottom and fill up the entire stalk. The storing of this food for consumption later in the winter must be important in woodpecker eyes, since the acorns were brought from a considerable distance from the mountains where alone the oaks grow. This account tallies so well with the habits of the California Woodpecker and is so unlike the known habits of *Colaptes* that I am led to raise the question whether or not the bird was that species and not the red-shafted one. At all events the birds were woodpeckers, and they appear to have hit upon a safe place of deposit which argues well for their intelligence.

While I do not doubt that the acorn-storing habit is based on the more or less definite intent to provide food for future use, the faulty methods employed and the imperfect results obtained show that as yet the birds have only imperfectly learned their lesson. Thus when the acorn season arrives the birds do not systematically proceed to fill all the available holes and then make others as needed, but dig holes at any and all seasons as they have leisure or feel inclined. The result is that the supply of holes in a locality usually far exceeds the number of acorns stored, with a corresponding waste of energy and lack of foresight.

In searching for the motives underlying the storing habit of the California Woodpecker we should not lose sight of the fact that the several acts in the process, the boring of the holes, the search for the acorns, the carrying them to the holes and the fitting them in, bear no semblance to work in the ordinary sense of the term, but is play. I have seen the birds storing acorns many times, and always when thus engaged they fill the air with their joyous cries and constantly play tag with each other as they fly back and forth. When thus engaged they might not inaptly be likened to a group of children at play.

In further illustration of the play habit of this woodpecker it is to be noted that its bill, as in the case of others of its tribe, is wonderfully well adapted to digging into wood, and it is as natural for the bird in its idle moments to dig just for the fun of it as it is for the boy to whistle or the proverbial Yankee to whittle a stick. I have many times observed the Downy and the Hairy Woodpecker drilling holes in sound trees with no apparent purpose unless to occupy an idle moment. I have also noticed in Maine live fir trees in the trunks of which several inches of bark and wood had been dug out by the

\*Observations sur les Moeurs de Divers Oiseaux des Mexique, 1858.

Pileated Woodpecker for no apparent reason, and I am constrained to the opinion that in such cases amusement has much, if not everything, to do with the act. So, too, it appears to be when the Hairy Woodpecker beats a tattoo on a dry resonant limb, a very pleasant musical sound even to human ears, with no apparent object in view save the fun of making a noise or perhaps occasionally signalling to some distant mate. We may note in passing that one result of this play habit, though probably not anticipated by the bird, is to keep the bill and the muscles connected with it in serviceable condition for the more serious labor of digging out larvae from the wood.

The California Woodpecker is not the only one of our birds that has glimpsed the advantage of storing food against the time of need, as witness the impaling of mice, small birds, and insects on thorns or in the forks of branches by the shrike. In the case of this bird, however, the habit, not a frequent one I think, is more often than not unavailing, since the bird more often than not fails to profit by its foresight in any way, either forgetting all about its stores, or, perhaps, wandering too far away to make it worth while to return to them. In any event the usefulness of the habit to the bird must be very small, and is, perhaps, to be viewed as a habit in the very early stages of its birth. In this connection one is tempted to ask why other woodpeckers, particularly the Red-head, which is a mast eater and in many of its habits strongly resembles the "Carpintero", have not hit upon the device of storing food, as, in fact, some of them have while others have not. Thus Merriam\* tells us that in the Adirondack region the Red-head winters or not according to whether it is or is not a beech-nut year. It would thus appear then that the Red-head of the Adirondack region has not acquired the habit of storing away beech nuts, and so far as my own observations about Washington go, as also those of other observers, the Red-head never stores away food of any kind but depends upon what it can obtain from day to day. When this fails it accepts the alternative of migration and departs for regions where supplies are more readily obtainable. Nevertheless the Red-head in certain localities does store away food, apparently habitually.

Much to the point are the observations in central Indiana made and recorded by O. P. Hay in the *Auk*, 1887, p. 193, which show the Red-head as an active hoarder of food. They are so interesting that I quote them almost verbatim.

From the time the nuts [beech nuts] began to ripen, these birds appeared to be almost constantly on the wing passing from the beeches to some place of deposit. They have hidden away the nuts in almost every conceivable situation. Many have been placed in cavities in partially decayed trees; and the felling of an old beech is certain to prove a little feast for a bevy of children. Large handfulls have been taken from a single knot-hole. They are often found under a patch of the raised bark of trees, and single nuts have been driven into the cracks in bark. They have been thrust into the cracks in front gate-posts; and a favorite place of deposit is behind long slivers on fence posts. I have taken a good handfull from a single such crevice. . . . In a few cases grains of corn have been mixed with beech-nuts, and I have found also a few drupes apparently of the wild-cherry and a partially-eaten bitter-nut. The nuts may often be seen driven into the cracks at the ends of railroad ties; and, on the other hand, the birds have often been seen on the roofs of houses, pounding nuts into the crevices between the shingles. In several instances I have observed that the space formed by a board springing away from a fence-post, has been nearly filled with nuts,

\*Remarks on Some of the Birds of Lewis County, Northern New York, Bull. Nuttall Orn. Club, July 1878, p. 123.



and afterwards pieces of bark and wood have been brought and driven down over the nuts as if to hide them from poachers. . . . An examination recently of some of these caches showed that the nuts were being attacked by animals of some kind. The Red-heads are frequently seen in the vicinity of these stores and they sometimes manifest great impatience at the presence of other birds.

It may be added that observation clearly showed that the stored nuts were subsequently used for food.

Another instance of the storage of food by the Red-head was published in Bull. Nuttall Orn. Club, April, 1878, p. 97, by Mr. H. B. Bailey, being an extract from a letter received from Mr. G. S. Agersborg of Vermilion, Dakota, as follows:

Last spring in opening a good many birds of this species (*Melanerpes erythrocephalus*) with the object of ascertaining their principal food, I found in their stomachs nothing but young grasshoppers. One of them, which had its headquarters near my house, was observed making frequent visits to an old oak post, and on examining it I found a large crack where the woodpecker had inserted about one hundred grasshoppers of all sizes (for future use, as later observations proved), which were put in without killing them, but they were so firmly wedged in the crack that they in vain tried to get free. I told this to a couple of farmers, and found that they had also seen the same thing, and showed me the posts which were used for the same purpose.

In respect of this habit of storing away live prey for future use the Red-heads of Dakota are unique, and I know of no exact parallel to it.

I have received the following interesting note from Miss Marion J. Pellew on the habits of the Red-head in South Carolina, which not only shows that the local woodpeckers there are storers of food but that their method results in considerable damage to property.

About Aiken, South Carolina, the Red-headed Woodpeckers are very abundant, and are very common in the town. As soon as the poles carrying electric wires begin to show cracks, the birds begin stuffing the cracks with acorns which are hammered in. An official of the electric light and power company of Aiken states that the company sustains an annual loss of several thousand dollars due to the operations of these woodpeckers, both from the drilling of holes, and from the rotting of the wood caused by the storing of the acorns.

Miss Pellew further states that she noticed that the board along the ridge pole of her house was curling up, and on investigation it was found that under this board for a distance of from 8 to 10 feet from the eaves were decayed and half decayed acorns to a depth of at least 1 inch, and a friend of hers had the same experience.

It is well known that the Red-heads dispossess other birds of their nesting sites in the holes of trees, and even destroy their eggs and kill their young: but the following observation by Bendire given in his "Life Histories" is in some respects unique. He saw a Red-head eat part of a young bird, probably a bluebird, and store away the remainder "behind the loose bark of an oak post". This was in Holland Patent, New York. Visiting the place the following morning, he found that the remains were gone and, though definite proof was wanting, he inferred, probably correctly, that the bird had returned to its store and eaten the remains of its victim.

In view of the above interesting observations it seems highly probable that the Red-head is more of a food storer than our scanty records indicate, and that elsewhere than in the locations mentioned it depends to a greater or less extent upon food laid by for future needs.

The crow is certainly one of our most sagacious birds, but, so far as I know, no one has ever found it storing away supplies of any kind though it inhabits regions where in winter it is often put to it to make a living. Perhaps European crows are a bit ahead of their American cousins. At any rate I find a paragraph in Yarrell's *British Birds* (vol. II, p. 288) which seems to prove that the habit is not entirely unknown to at least one member of the crow family, namely, the Black Crow (*Corvus corone*). Yarrell says of it: "Its method of hiding portions of food that cannot be conveniently eaten suggests an amount of forethought that can be pardonably exaggerated." This statement regarding the Black Crow calls to mind Dickens' raven, or rather the compound of his two ravens, which he immortalized under the name of Gripp, and which he says had the habit of burying in the garden "cheese and halfpence". Gripp, however, was a remarkable bird in so many different ways that we need not wonder at this departure from the usual habits of his kind.

Our jays are mast eaters par excellence, and I believe that closer field observations will show that the habit of storing supplies is more common among them than we have been led to believe, particularly the species that winter in the colder regions. I am not aware that the Blue Jay, or, indeed, any of the species within our own boundaries have acquired the habit, but the Whiskey Jack of the far north, according to Richardson\*, is fully alive to the importance of laying up food against the time of snow and extreme cold. He says of it: "It hoards berries, pieces of meat, etc., in hollow trees or between layers of the bark of decaying branches, by which it is enabled to pass the season in comfort, and to rear its young before the snow is off the ground, and indeed earlier than any other bird in the fur countries."

Turning now to the nuthatches we might confidently predict that such lovers of mast would have hit upon the storage plan, but data on the subject are not over plenty. In the *History of North American Birds*, by Baird, Brewer and Ridgway, we find a note stating that "the European species collect and store away the fruit of the hazel and other nut-bearing trees", and I am sure that our own species, the white-belly, has been credited with the same habit, though I can find no direct reference to the subject. This would seem to indicate at least that the habit is not common. Dr. Chas. W. Richmond, however, informs me that not once but many times he has seen nuthatches, familiar guests at his lunch counter, bear off and store away peanuts and even suet in the crevices of the bark of trees and in the cracks left by the weathering out of the mortar in the walls of his house. This habit of storing suet in cracks in the bark of trees has been observed about Washington also by Dr. A. K. Fisher and Mr. McAtee. Ordinarily, however, it is probably true that the White-bellied Nuthatch, energetic worker as he is, finds no surplus to store, but has to devote all his energies to digging out today's supplies without taking thought of tomorrow. Given the surplus, however, to draw upon, the bird's instincts, as we see, are equal to the occasion.

To return to our California Woodpecker: I see no valid reason for accepting the theory of the older ornithologists that the holes in the bark and dead limbs of trees were originally bored by the birds in the pursuit of insects. Apart from the fact, as has been dwelt upon, that this particular woodpecker

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\*Fauna Boreali-Americana, 1831, p. 295.

is only to a small extent an insect eater, the holes, at least those I have examined, are usually bored in sound wood or bark, and the wood around the holes shows no signs of ever having been inhabited by larvae of any kind.

The choice of trees to act as granaries has always seemed to me largely a matter of chance, being chiefly determined by proximity to the acorn-bearing trees. Their bark being soft and easily drilled, pines are, perhaps, on the whole the favorite trees. But I have seen scores of dead oaks, the bark of which had long disappeared, which had been used apparently for years for storage purposes, and in many of these every available bit of space had been utilized.

I do not seem to be able to recall any instances of the use of live oaks for storage purposes, but Dr. Merriam and Dr. Fisher both assure me that live oaks (*Quercus agrifolia*) are occasionally selected, and a photograph made by Dr. Fisher on the premises of Dr. Jordan at Palo Alto (see frontispiece, Condor, VIII, September, 1906, p. 106), is visible proof of the fact. Probably in this and other similar cases it is Hobson's choice, and live oaks are taken because they are the best available.

An example of a still wider departure from this bird's custom appears in the accompanying photo (fig. 22) made by the author near Ukiah, Mendocine County. The colony of woodpeckers located here had taken advantage of the long summer vacation, when the building was untenanted, to improve the school house up to woodpecker standards; and, while the results would hardly commend themselves to the school supervisors, they at least increased the utility of the building from the woodpecker standpoint. Nor is this example of woodpecker industry highly exceptional, and Mr. Carpenter, then a photographer of Ukiah, told me that in an adjoining county a school house had been so disfigured by woodpeckers that it was found advisable to build a new one rather than to repair the old. Such instances of serious injury to buildings must be rare, if for no other reason than that it is only in structures temporarily abandoned that the birds find their opportunity.

It is of interest to note that, while holes drilled in trees for this and for no other apparent purpose by the California Woodpecker is its common method of storing acorns, it is not the only one. Thus near Ukiah I found the woodpeckers harvesting the acorns and dropping them into the cavities formed by hanging pieces of bark, some of these containing from a gill to a half pint or more of the mast. This departure from the birds' usual custom is the more difficult to explain since there were plenty of pines near by of which they might have availed themselves. Sumichrast found them doing the same thing in Mexico as quoted by Baird, Brewer and Ridgway, North American Birds, vol. II, p. 571. After describing the usual method he adds: "At other times they make their collection of acorns in the openings between the raised bark of dry trees and the trunks". Such cavities, indeed, may have been the original store houses. If so, the present method is a decided improvement, since, when stored in such cavities, there seems to be no way by which the birds can reach them, though they are quite accessible to mice and squirrels. This particular storage method furnishes a remarkable example of indiscriminating instinct. The bird follows the blind impulse to store, but in such an ineffective way as to gain little or nothing by the act.

That acorns are often "wormy" everyone knows who has gathered them



Fig. 22. SCHOOLHOUSE NEAR UKIAH, MENDOCINO COUNTY, CALIFORNIA, USED AS ACORN GRANARY BY CALIFORNIA WOODPECKERS.

for study or for other purposes, but I find no convincing reason for the belief that the California Woodpecker is sufficiently versed in entomological lore as to store away acorns for the sake of the weevils that later are developed in them. If proof to the contrary is desired it is to be found in the results of Beal's investigations of the food habits of the species in Biological Survey Bulletin No. 34. He there states that 77.57 percent of this woodpecker's food consists of vegetable matter, compared to a little less than 23 percent of animal matter, which of itself compels us to class the species as chiefly vegetarian. Moreover he found in the stomach contents the remains of no boring larvae whatever. Notwithstanding the absence of larvae in the stomachs of the 75 specimens examined by Beal I do not doubt that larvae of any sort would be welcomed by the woodpecker, but evidently they are not specially sought for. The bird is essentially vegetarian, and, indeed, as Beal points out, more than half of its food consists of the meat of acorns.

In passing, we may note that only 21 percent of its food throughout the year consists of ants, which, while a respectable allowance, is small when we recall the fact that Swainson, in selecting a specific name for the bird, called it "formicivorus" or ant-eating, thus laying undue stress upon its ant-eating habits.

The discovery of the edibility of the acorn, however, was not made alone by the woodpecker. Even today the acorn crop is an important one to the Indians, and in bygone days it furnished the California aborigine his most important staple. There is, too, quite a list of birds and mammals that are more or less dependent for food upon the acorn, and, one and all, these are looked upon by the woodpecker as enemies and treated as such. His store houses are well known to jays, mice, rats, and squirrels, and are regularly raided by these less industrious and unscrupulous foes whose rule of conduct is well expressed in the lines, "He should take who has the power; He should keep who can." When at home the woodpecker has little trouble in defending his own, but we may safely assume that no small part of his hoard always goes to his unscrupulous neighbors.

An incident witnessed by me illustrative of the warfare waged by the woodpecker against the squirrel may be worth relating. While out one day in Mendocino County with my camera I heard loud outcries from 8 or 10 "Carpinteros" coming from a dead oak. Inspection revealed a ground squirrel flattened out on a limb some forty feet or more from the ground, this being the first and only time I ever saw a ground squirrel as far from mother earth, although in this county, which is heavily wooded, the ground squirrels are more addicted to climbing trees than I have observed elsewhere. Apparently the squirrel had been detected in the act of robbing the woodpecker's larder, but I arrived on the scene much too late to witness the beginning of the fracas. The birds were thoroughly enraged and were taking turns in making spirited dashes at the squirrel, at the same time filling the air with their vociferous threats. It was quite evident that the squirrel might have escaped from his foes easily enough by running down the tree or by jumping to the ground, apparently no great feat even for a ground squirrel; but he seemed to be completely paralyzed by fright and afraid to move in any direction or do anything by way of self protection. After watching the strife for some time and noting that it was likely to be a prolonged one the squirrel was brought down

for close examination by a small bore rifle. It was then found that the attack by the birds was even more serious than it appeared, for they had punctured the skin in places along the back and drawn blood with their sharp bills, and in time, perhaps, might have killed the rodent.

The California Woodpecker is not exceptional in its hatred of its traditional enemy, the squirrel, and Merriam, as above cited, was witness to attacks by the Red-head on both the grey and the black squirrel. Evidently the woodpeckers of the Adirondack region look upon the crop of beech nuts as peculiarly their own, and promptly resent on the part of outsiders any attempt to share in it. Not woodpeckers alone are a bit hazy in respect to property rights, and the enforcement of conflicting views on the subject often leads humans into acts that bear a curious analogy to the ones above noted.

Take him all in all, the California Woodpecker presents a rarely inviting subject for study, especially with reference to the genesis and significance of its food storing habits. Since California at the present time is exceptionally fortunate in the number and activity of its bird students it is to be hoped that among them are those who will take up the subject systematically, and endeavor to unravel the many puzzling questions that touch upon the life history of this beautiful and interesting species.

Washington, D. C., May 15, 1921.

## THE STORAGE OF ALMONDS BY THE CALIFORNIA WOODPECKER

By CLAUDE GIGNOUX

WITH ONE PHOTO

ON Saturday, March 26, 1921, I spent about two hours inspecting the larger trees and the buildings on the ranch of Mrs. Nora Thresher, in Butte County, California, to obtain information in regard to the storing of almonds by the California Woodpecker (*Melanerpes formicivorus bairdi*). The three places at which we found almonds stored are close together near the ranch house. The locality is one quarter of a mile west of the Feather River, five miles northeast of Liveoak, four miles southeast of Gridley and one and a quarter miles east of the Manzanita School, and is in Township 17 N., Range 3 E., M. D. B. and M. The country for several miles in every direction is practically level and very fertile and the mature native trees left standing are magnificent individual specimens. There are many fruit orchards in the section from Marysville to Gridley, and almonds are extensively grown farther north, around Durham. On the Thresher ranch there is a very heavy growth of trees and brush along the Feather River and this heavy growth extends a considerable distance in both directions along the river beyond the boundaries of the ranch.

Mr. Gerald J. Chalmers, whose ranch adjoins the Thresher ranch, had told me that he had found almonds stored in the bark of an oak tree, on the Thresher ranch, which had been cut down about the middle of February, 1921,

a slab of which he kept and handed to me on the day of our hunt for stored almonds. This slab is 16 inches long, 5 inches wide at one end and 7 inches wide at the other. It has been delivered to the Museum of Vertebrate Zoology in Berkeley. The photograph of a portion of this piece gives a clear idea of just how the original appears (see fig. 23). The tree from which it was taken had been cut down, sawed into firewood lengths, and split up by a machine. The pieces were then thrown into a pile and ranked in tiers. In this process each piece of wood had been subjected to a great deal of rough handling and it is surprising that any of the nuts remained in the bark.

We found almonds stored at three places: (1) In the bark of the oak tree mentioned; (2) in the side of a rather old barn; and (3) in the bark of a

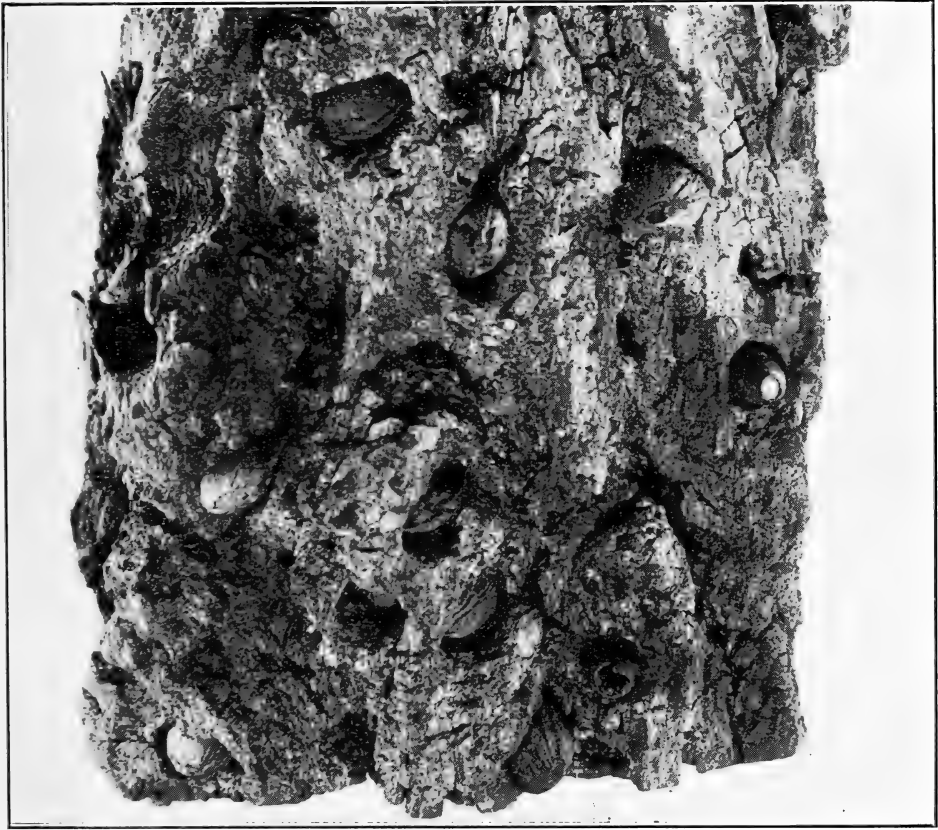


Fig. 23. PORTION OF SLAB FROM VALLEY OAK SHOWING ALMONDS AND ACORNS IN PITS, THE WORK OF CALIFORNIA WOODPECKERS IN BUTTE COUNTY, CALIFORNIA.

living, standing oak. There were within an area of perhaps ten or a dozen acres about fifteen large standing oaks, five or six recently felled oaks and several farm buildings, some of which were quite old. A crew of men was cutting up one of the trees and ranking the wood up in tiers.

At point number 1 the tree had been cut down close to the ground and completely cut up in firewood lengths and these ranked in tiers. We found several pieces, in the bark of which acorns and almonds had been stored or in which holes had been drilled for acorns or almonds. The slab in the photo-



graph is a part of this tree. Mr. Chalmers said that this tree was almost wholly dead when felled. The slab shown in the photograph is dried and worm-eaten. Nothing was learned as to the part of the tree from which the slab came but it was evidently from the trunk or a large limb. Mr. Chalmers thought the tree was a Valley Oak (*Quercus lobata*), but this is not intended as a definite identification. From the number of drilled holes with or without acorns or almonds in them it was evident that the bark of the tree had been extensively used as a storage place both for acorns and almonds. There were several large decayed holes in the tree and in these we found both acorns and almonds, but they were not fitted into specially drilled cavities. When the tree was felled Mr. Chalmers was present and he told me that a pair of owls flew out of one of these large holes after the tree had fallen to the ground. We learned nothing as to the means by which the acorns and almonds were placed in these decayed cavities. The only opened almonds we found were from these decayed places. We thought that these almonds had not been opened by woodpeckers.

At point number 2 holes had been drilled in the boards on the west side of a large barn and many acorns and a few almonds stored in them. All the holes were above the level of the top of the main door. All the drilling had been done in boards resting against the larger timbers of the frame. There were drillings in the ends of boards where the boards rested against a horizontal plate over the doorway and pretty much across the front of the barn along this timber and up along the upright timbers as well. No holes were drilled except in the outer surface of the boards where the boards rested against the frame. We thought that the holes, or most of them, went through the boards and into the timbers of the frame.

At point number 3 the bark of the whole trunk above a point about twelve feet from the ground and most of the bark of the larger limbs had been drilled and hundreds if not thousands of acorns and almonds stored. Mr. Chalmers expressed the appearance of the bark very well when he said, "There must be a sack of almonds up there". This tree was a living oak and we thought it was a Valley Oak. There were more dead limbs on this tree than we found in other similar trees in the vicinity. The tree is very large and must be about five feet through the trunk one foot above the ground. In some of the limbs were holes that we thought were the entrances to the nests of woodpeckers but we did not see any birds enter or leave them. Acorns and almonds were stored in all sides of the tree and in all sides of the larger limbs we could see from the ground. We did not go up into the tree to see if nuts had been stored in the bark on the upper sides of the limbs.

This work is assumed to have been done by the California Woodpecker, which is a common bird in that country. The acorns were stored in the manner known to be employed by this bird and there seemed no reason to deny it credit for the almonds also. We did not, however, see them doing anything in connection with the storage places we found. Nearly all the acorns and almonds were inserted in the drilled holes point first but some were fitted in natural crevices sidewise. All acorns had been freed from their cups before being stored and all the almonds were without hulls. We thought that this tree contained about an equal number of almonds and acorns. Every nut was fitted in its place too snugly to be easily removed. In most cases the base of

the nut was flush with the surface of the bark or even a little countersunk. Some few were inserted so as to protrude more or less. Some were inserted about a quarter of the length of the nut but very tightly at that. Here and there was a nut too small to fill the hole made for it, but the orifice of the hole was too small to permit the nut to be easily taken out. There were many empty holes and some holes only partly drilled. Many of the acorns had been opened and the shells left in the drilled cavities. We did not find any opened almonds (except in the one instance noted) although many empty holes were found where almonds had been or which had been drilled for almonds. The difference between holes drilled for almonds and those drilled for acorns is very marked. We could not detect any disposition to drill the holes so that they would not hold water. All were about horizontal. Several almonds in the drilled holes looked as if an effort had been made to open them. The opening of an almond presents no difficulty to a bird that can cut a hole in dried oak.

Of course, acorns must be abundant all about. Mr. Chalmers said there were two almond trees on the Thresher ranch and I was told that until this spring there had been an almond orchard less than a half mile to the north.

Oak trees and California Woodpeckers have existed together for so long a time that they may be considered coetaneous. But almonds are not indigenous in California. The habit of storing acorns may have developed very gradually, but to whatever extent this bird has acquired a habit of storing almonds the development must have been of recent origin. The subject suggests many interesting possibilities and theories but I do not feel competent to go into that phase of the matter.

A gentleman living at Liveoak told me he had seen almonds stored in electric light or telephone poles at Pennington, eight miles east of Liveoak, and that he had heard of walnuts being stored in the same manner, but he could not give any details about the walnuts.

*Berkeley, California, March 31, 1921.*

## THE FLOCK BEHAVIOR OF THE COAST BUSH-TIT

By R. C. MILLER .

WITH MAP

THE STUDY of birds has had a tendency in the past to be extensive rather than intensive. The ornithologist has been engaged with the problems of distribution and speciation, of migratory instincts and migration routes, of coloration and adaptation, of food and economic importance, all of which, while thoroughly justifiable, have involved a generalized consideration of a large number of species. It has seemed to the writer that much is to be gained from a careful study of a single species, or even, as in the case of this paper, of a single aspect of the life history and relations of one species.

The study of birds from a behavioristic standpoint has been relatively neglected, and those investigators who have given the matter some attention have usually gone to one of two extremes: the field observers, being better naturalists than psychologists, have interpreted the behavior of birds in an extravagantly anthropomorphic fashion; and the experimentalists, being better psychologists than naturalists, have with amusing seriousness taken caged birds into the laboratory and assumed that they would there behave in normal fashion (cf. Porter, 1904 and 1906). What we need would seem to be a new science of "field psychology" which should combine in due proportions the observational and experimental methods.

The studies in behavior which follow\* have been limited to the coast race of the Bush-tit (*Psaltriparus minimus minimus*), which occurs in considerable numbers on the Berkeley Campus, ranging over more or less definite areas of live oak and chaparral associations, or cultivated shrubbery. The birds are gregarious during the greater part of the year, pairing off in February or March for the breeding season, and congregating into flocks again when the young are reared. The flock formation is relatively simple and loose, so that a much better opportunity is offered for analyzing flock-behavior than would be the case with birds manifesting a more complicated flock organization. Moreover, observation has convinced me that the birds remain pretty much in the same locality all through the winter, so that the complication of a changing series of flocks is not introduced.

The University Campus and neighboring hills and canyons have served as the field of operations.

Three flocks of Bush-tits have frequented the territory under observation during the past winter (1920-21). The largest of these numbered about seventy individuals, the other two, respectively, twenty-five and twenty. These figures are based on averages, as the number of birds in a flock often varies in a puzzling manner, even while under actual observation. Such discrepancies are doubtless due in part to the difficulties involved in making accurate counts. The little creatures are in constant motion, popping in and out among the bushes, appearing and disappearing in a confusing manner, so that they can be successfully counted only as they occasionally straggle across an open space along the forage route. But allowing for a margin of probable error, the impression is still conveyed that there is an actual variation in the number of birds in a particular flock at different times, individual birds perhaps becoming lost, or passing from one flock to another.

These three flocks were observed on August 28 and again on October 16 and subsequently, but not until the middle of the winter did the idea occur to me that they might represent the entire Bush-tit population of the region under observation. Thereafter I made a practise of "rounding up" the Bush-tits in the locality from time to time, always beginning by scouring the campus thoroughly, then working up Strawberry Canyon. In every case I was able to locate the three flocks above mentioned.

In addition to these periodic round-ups, I have made a practise of keeping record of every flock of Bush-tits seen on the campus, with time of day, general

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\*NOTE.—This paper is chiefly an abridgement of a Master's thesis written at the University of California during the current year. I am indebted to Professor Joseph Grinnell, under whose guidance this work was undertaken, for many helpful suggestions as to method, as well as much valuable information from his personal observations.—AUTHOR.

direction of movement, and numbers, either actual or estimated. I find these observations to agree with my assumption of three flocks, one large, the other two smaller and of nearly equal size.

It is manifestly impossible to be absolutely certain that flocks of similar size observed in the same region at different times are identical; but repeated observation has given the impression very strongly that the flocks observed in February are in general the same ones seen in August preceding, though individual birds probably sometimes pass from one flock into another. I may add that I have never observed the Bush-tits more than one hundred yards up along the sides of a canyon, and it may be that relatively small hills, especially when sparsely clothed with vegetation, form to them a somewhat effectual barrier. I think it extremely unlikely, for instance, that the number of birds in Strawberry Canyon would be augmented by an invasion of Bush-tits from Claremont Canyon, or vice versa. The topography of the region furnishes additional reason for believing that the birds I have had under observation are limited to the narrow range which I have assigned to them.

I early noted that, as Swarth (1914, p. 501) has observed, the Bush-tits appear with considerable frequency in certain tracts of trees and bushes on the campus, so as to suggest the possibility of their having definite forage routes, which are covered at more or less regular intervals. Working on this hypothesis, I undertook to map out the forage routes of the different flocks, and, by taking note of the intervals at which they recurred at certain definite points, I thought perhaps to be able to prepare a schedule of their movements. At first I seemed to have some degree of success with this part of the work, and on one or two occasions I was able to predict the whereabouts of a particular flock from my hypothesis, and to find the birds exactly where I had expected them. But frequent subsequent failures have led me to conclude that success on these occasions was entirely accidental; and as I now look through my notes, I am unable to trace out anything approaching systematic progression over a well defined route. Any impression of regularity in the movements of the birds is doubtless due to mechanical causes, such as relative density of shrubbery and other foliage in different parts of the range.

A method of observation to which I have been partial is that of attaching myself to a particular flock of Bush-tits and following it about for a considerable period of time. For purposes of illustration, I wish to record in some detail the wanderings of a flock observed in Strawberry Canyon on February 11. A map of the region in question has been introduced (fig. 24), which should be consulted in interpreting the following account.

9:35 A. M.—Flock of 16 Bush-tits observed at A. Foraged through bushes to B; 5 birds crossed road to C, then straggled back again to B, then to D; one returned to C and foraged alone for several minutes, then was joined by 6 others. The remainder of the flock retraced to A, then moved on to E, to be followed shortly by the stragglers at C. The entire flock then moved across the road to F, which marks the edge of a small but dense thicket.

From F the flock foraged in a leisurely fashion through to the east side of the thicket at G, then along its edge to J. At G one bird left the flock and crossed to H, where it foraged about 8 minutes, then rejoined the flock at I. From J the entire flock then retraced to I, crossed over to H, then moved slowly on to K and finally L, where they foraged in a live oak for a considerable period of time. At \* one bird flew down and foraged for a few moments in the grass, a quite unusual type of behavior, which I have seen on only one other occasion.

One bird presently moved across to the bay tree at M, and was followed shortly afterwards by two more. Three others retraced to H, and the main body of the flock straggled after. The birds at M, finding themselves left behind, hastened after their companions. All now returned to the thicket at N, foraged slowly over to O, then down to P, and finally crossed the road to Q in their characteristic straggling fashion, one bird venturing out and being followed shortly by the others.

In counting the birds as they flew across the road at this point, I was surprised to find that the flock now numbered 21; 5 stragglers, either of this or some other flock, had been gathered up in the thicket.

The flight from P to Q occurred at 10:45, the flock having remained for almost an hour in a patch of brush about one-eighth acre in extent.

The birds foraged in the one large oak at Q for 24 minutes. At 11:00 o'clock one bird ventured to another oak at R, but none of its companions followed, and it soon returned. At 11:09 a bird flew across to S, but seemed timorous and at once returned

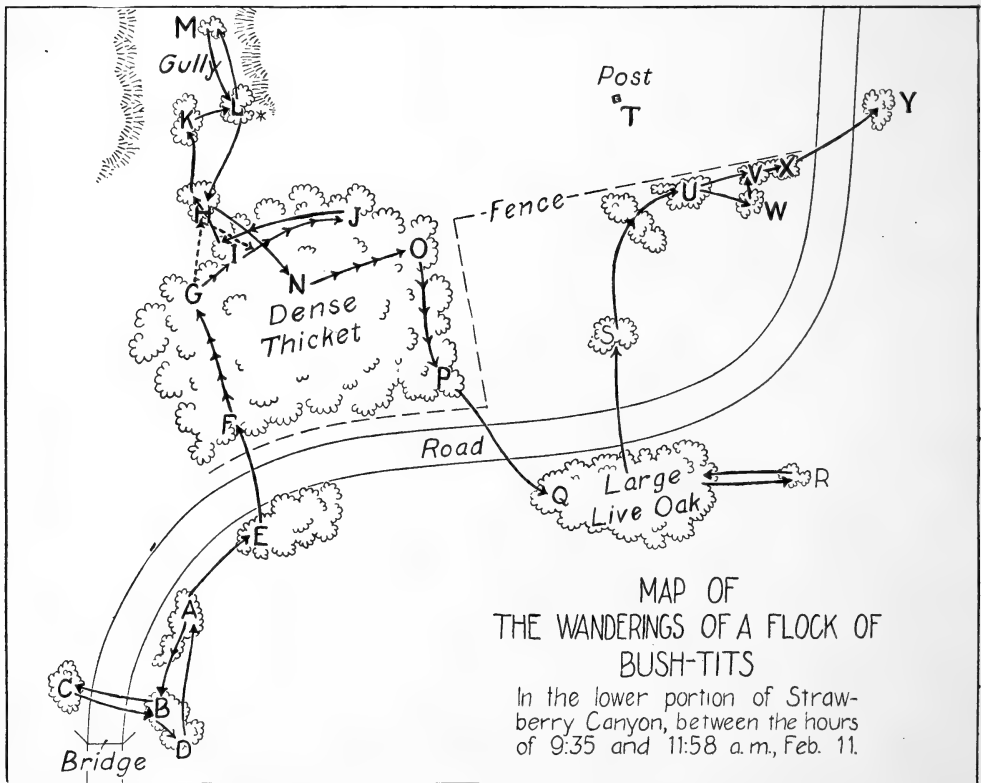


Fig. 24.

to Q. Then another ventured across, and the flock presently followed in their usual manner. At T a Sparrow Hawk appeared and perched on a near-by post, but was not noticed by the Bush-tits.

At U the flock became divided, about half remaining at V, the rest foraging in a fallen oak (still green) at W. Later the two divisions rejoined, with the exception of 4 individuals (2 pairs?) which remained behind and did not rejoin the flock as long as I observed them. I interpreted this as an indication of the advent of the mating season, when the flocks gradually break up into pairs. Subsequent observations showed the flocks to be rapidly dwindling, and tended to confirm this opinion.

While the birds were in the oaks, a California Jay swooped in among them, causing great alarm for a moment, until the intruder was identified. This reaction to Jays I have frequently noticed, although as far as I know the larger bird does not harm the Bush-tits, and they manifest no fear of a perching Jay.

About noon one bird flew across the road to the clump of oaks marked Y, and was followed by 13 others. Three more followed hurriedly a little later. I did not observe the birds further.

Thus it is seen that the flock when first observed was composed of 16 individuals, that 5 were added while the birds were in the thicket, and that 4 later left the flock, so that the number remaining when observations were discontinued was 17. This affords a good example of the puzzling fluctuation in numbers which I have above mentioned as leading me to conclude that the flock organization is relatively loose and that birds probably pass from one flock to another with considerable frequency.

Doubtless the reader, if he has had the patience to follow the observations above recorded, has been struck with the lack of system or direction and the unnecessary retracing of routes manifested by the birds, their behavior in this respect being somewhat suggestive of that which Mark Twain has attributed to ants in his classical essay on that subject. The method of progress of the birds may be analyzed as follows:

The flock is foraging, let us say, in the outer foliage of an oak tree. The twigs and leaves are examined in quite a thorough manner, the birds inspecting them from above, or clinging, as they do frequently, upside down and examining the under surfaces. Presently some individual finds the forage poor; no more scale insects or aphids are to be found in its immediate vicinity; it begins to look about in search of fresh fields and pastures green. Yonder is a clump of chaparral that looks promising. A few yards of open space must indeed be traversed in order to reach it, and Bush-tits have a native abhorrence of open spaces; they are natural agoraphobiacs. But hunger is a strong stimulus. The bird hesitates a moment, then darts out and with hurried, undulating flight crosses to the chaparral.

Now other individuals of the flock find food beginning to run short in the oak foliage. They too see the near-by clump of chaparral; they have seen their companion make the flight successfully; they hear his notes, perhaps indicating that he has found food; they themselves are encouraged to make the venture.

Now the impulse spreads; in groups of two or three or five, others dart across from the oak to the chaparral, until shortly the whole flock has moved to the new location.

I would not attempt to maintain that all the steps I have indicated here pass as successive ideas through the minds of the birds. I have merely outlined the impression which their behavior gives to the observer. The analysis of what goes on in an avian mind is a problem which the comparative psychologist does not regard with appreciable optimism. But of the following objective facts we may, I think, be certain:

1. The flock moves from place to place by what may be termed the spread of impulse. An individual bird, moved no doubt by the hunger instinct, takes temporary leadership, and is followed to a new location by the others. There are no regularly assigned leaders, though probably the most venturesome birds assume the leadership most often.

It should be noted in this connection that Trotter (1916, p. 29) has attributed a similar type of behavior to the mammalian herd: "Each member of the flock tending to follow its neighbor, and in turn to be followed, each is in some sense capable of leadership".

2. The line of flight between two locations is usually determined by the first adventurer. Ordinarily it represents the shortest distance across an open space. The other birds gather at the point of departure and follow suit, possibly through imitation, or because the tested route appears the safest.

3. Sometimes two or three self-appointed leaders move off simultaneously in different directions. It seems then to be largely a matter of caprice which one the flock follows. Each leader may have a following, and the flock for a time become divided into two or three segments; or the flock may follow any one of the leaders. In any case a bird which ventures into a new location and is not followed by others soon loses its wanderlust and hastens to rejoin its comrades.

4. Individual birds which are finding good foraging may lag behind until the flock is some distance away. Then they appear suddenly to wake up to the fact that they have been left alone, and hurry after the flock with excited calls. Occasionally these loiterers become lost entirely; thereupon they become greatly agitated, and move rapidly from place to place, uttering the location note so loudly and continuously that I have sometimes mistaken the notes of a single bird for those of an entire flock. It is extremely probable that such lost birds attach themselves to the first flock they find, regardless of whether or not it is the one of which they originally formed a part.

5. At more or less frequent intervals the flock tends to become assembled in a relatively small space, the branches of a single oak, for example, and there to pause long enough for stragglers to catch up. It will be seen by reference to the observations above recorded that such reunions occurred at points E, J, and Q. This type of behavior is probably unmotivated, and may even be due to mechanical causes, such as the nature of the forage route; but it is of frequent occurrence, and probably is of considerable importance in keeping the flock together.

6. Call notes play an important role in flock behavior (cf. Grinnell, 1903). The principal notes are a location note, uttered more or less continuously, which functions in keeping the flock together while foraging, an alarm note, and a "confusion chorus" which is uttered by all members of the flock in concert on the appearance of certain enemies, e. g., a Sharp-shinned Hawk.

7. The method of flock movement makes evident the extreme improbability of there being any definite forage routes. The direction taken by the flock at any time is a matter of caprice, or the circumstances of the moment. Due to their dislike for crossing open spaces, however, the birds are likely to frequent areas where the vegetation is continuous and will generally avoid those where it is discontinuous, so that an impression of regularity in their forage movements may thus secondarily be given.

Whether or not the differences between the flock behavior of the Bush-tit and that of various other birds manifesting a more complicated type of flock organization are differences of kind or of degree only, is a subject for further investigation. There is a field here for much interesting and profitable work, and it is the belief of the writer that such studies are likely to be



of value in connection with the general problem of group psychology.

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*Department of Zoology, University of California, June 11, 1921.*

## GENERA AND SPECIES

By RICHARD C. MCGREGOR

I HAVE read with much interest and appreciation the article by Witmer Stone on the use and abuse of the genus<sup>1</sup>. Briefly stated, Doctor Stone's protest is against the excessive division of genera that has been proposed by some recent authors; he suggests that we use the broader generic divisions of a few years ago for nomenclatural purposes, restricting the finer superspecific divisions to occasions when such distinctions are required. This subject erupts more or less periodically<sup>2</sup>, and one might derive some entertainment from a study of its cycle and predict the year of the next activity.

As ornithological nomenclature has been one of the chief sufferers from the abuse described by Doctor Stone, it would be appropriate for the *Condor* and other leading ornithological journals to publish comment on this subject. Therefore, a few words are offered for the sake of provoking discussion.

The general tendency, in ornithology at least, is to recognize finer and more trivial characters and, accordingly, to break up old groups and to name more families, genera, etc. With ever-increasing collections and the more intensive study of specimens, the systematist inevitably recognizes differences that escaped detection before, and exaggerates the significance of minor differences. The result is that the genus must be based upon slighter characters than formerly; the rank of the group is thus degraded. This may lead to a condition in which each species of a family is the representative of a genus, the interrelations of the species are no longer indicated, and the generic names become absolutely worthless.

The groups of taxonomy are imaginary and have no existence in nature.

<sup>1</sup>Science, vol. 51, 1920, p. 427.

<sup>2</sup>For example, note the activity of about five years ago, indicated by Sumner, F. B., *Science*, vol. 41, 1915, p. 899; Van Name, W. G., *Science*, vol. 42, 1915, p. 187; Colton, H. S., *tom. cit.*, p. 207; Allen, J. A., *tom. cit.*, p. 492.

The limits of a group can be stated only in relative terms. A species is one kind of an organism, but the degree or the quality of difference that shall separate one species from another cannot be stated. A genus is a group of closely related species, but no one can say how closely they must be related. Even the individual is but a phase in the great organic stream and is intimately connected with its parents and its offspring. If we had before us all of the expressions of life that have been, who could venture to designate genera and species? When we say that a species is well marked, we mean that we are ignorant of its close relatives, which may be living or fossil. While we are defining a species, it becomes something else. The present is gone as we say it and has become the past. In practical taxonomy, of course, we treat genera and species as if their characters were fixed, and fortunately most of the species of taxonomy differ enough so that they can be easily recognized.

I have long believed what Doctor Stone points out; namely, that we try to make our system of nomenclature do double duty and that this is an "impossible burden" or, at least, it is an attempt to force on the generic name a function for which it is not fitted. I have also had in mind to suggest exactly the remedy proposed by Doctor Stone; namely, the reduction of the weaker so-called genera to the status of subgenera. My idea is that these subgenera are useful in keys to show the grouping of species in large genera.

Some botanists follow a practice that appeals to me as being very serviceable in connection with genera containing many species; this is the use of the section, in effect the subgenus. The name of a section is placed after the specific name and is used only when it is desired to show the position of the species in the genus. An illustration of this is found in the names of the plants that are commonly called begonias. There are several hundred species assigned to the genus *Begonia*, and probably as many more remain unknown to science. The species fall into several groups that many zoologists would certainly recognize as genera. How many botanists do so I do not know, but the more conservative among them resort to the use of sections when they wish to designate a part of the genus *Begonia*. As Doctor Stone points out, this retention of generic names in the broad sense is of assistance to those who are not specialists in the particular group; at the same time much of the transferring of specific names from genus to genus is avoided. For example, begonias are so well known as cultivated ornamentals that any reader would have some conception of the kind of plants indicated by the scientific names *Begonia pseudolateralis*, *Begonia mindanensis*, and *Begonia luzonensis*. If the section names were given generic rank, the same begonias would appear as *Sphenanthera pseudolateralis*, *Petermannia mindanensis*, and *Diploclinium luzonensis*.

Another method of dealing with the subgeneric name seems to be popular with some entomologists and others—the subgeneric name is inclosed within parentheses between the generic and the specific name. For example, *Colymbus (Dytes) auritus*, for the horned grebe. This style leads to unpleasant remarks on the part of the indexer, but no one considers his convenience.

Some systematists are inclined to give little consideration to the needs of the student of anatomy, geographic distribution, or general biology. In effect they say: "Only a specialist can judge of the validity of a genus or species." The general zoologist or botanist respects the work of the taxonomist and systematist and must take the classification and nomenclature of

these workers. However, the continual shifting of names and the dividing of satisfactory groups are sure to excite strong protests. No one wishes to return to the Linnaean conception of genera, but the tendency toward the other extreme seems less attractive. Names are for the use of people who talk or write about things, and names whose meanings are frequently changed are unfitted for any purpose.

Old generic names become endeared by long familiarity, but some of them must be sacrificed to the iron law of priority. We concede present convenience for promised fixity, but are we getting it? Certainly the busy genus maker is not helping us. *Anthus*, *Buteo*, *Chaetura*, *Diomedea*, *Empidonax*, *Fringilla*, and other old generic names are associated with certain birds, and I hope these names will be with us for a long time. When such names are displaced, shifted to other genera, or otherwise modified in significance, it is difficult to accept the changes in a kindly spirit. When the changes result from giving generic rank to weak subgenera, one is inclined to doubt the value of other work of the author who proposes such changes.

The names of the birds of Europe and of North America have been worked over so carefully that they should be fairly well settled. If they are not, what hope is there for the nomenclature of the birds of Asia, Africa and South America?

*Manila, P. I., February 26, 1921.*

## A SYNOPSIS OF CALIFORNIA'S FOSSIL BIRDS

By LOYE MILLER

**D**URING the several years that have elapsed since a previous synopsis of the Pacific coast fossil birds appeared in the *Condor* (Miller, 1911), our knowledge of the ancient faunas has made considerable advancement. The present writer has been especially occupied with an extended paper on the avifauna of Rancho La Brea. It seems improbable however that this memoir will be off the press for some time to come; hence it is thought advisable to announce to those interested in the subject, some of the results of recent activity in the California field.

Since the latest general paper on the subject was published by the writer (Miller, 1912) a new bird-bearing horizon, the Upper San Pedro Pleistocene has been explored (Miller, 1914). These beds yielded sixteen species of birds none of which are extinct. Bird remains from the Pliocene of Santa Monica and of San Diego have been collected by Dr. F. C. Clark of Los Angeles. These represent some species of auklet and a goose not distinguishable from *Branta canadensis*. Mr. E. J. Porteous of Lompoc, keeping the interests of science at heart, has rescued from the commercial quarries in the Miocene diatom beds of that region some most interesting bird remains. These specimens were generously turned over to the writer by Dr. David Starr Jordan. They are found to represent a new species of shearwater, two species of gannet, and one as yet indeterminate species of shore bird. This material includes the major portion of the skeleton of each of some ten or more individuals, a fact that is readily seen to hold considerable interest when one considers that a

single fragment of a humerus represents the total previously known bird remains from California deposits older than Pleistocene (Lucas, 1901).

Study of the enormous mass of bird material assembled at the University of California and at the Los Angeles Museum of History, Science and Art has been productive of most interesting results. The following is a synopsis of this work, only part of which has been made public.

Apologies are offered for one synonym imposed upon the literature of ornithology. *Pleistogyps rex* (Miller, 1910), based on a tarso-metatarsus, must give way to *Teratornis merriami* (Miller, 1909), previously established upon a skull and pectoral arch. Repeated occurrence of the two in the same section of the excavations forces the conclusion that the great bird known from the skull and pectoral parts was mounted upon the relatively frail posterior limbs ascribed to *Pleistogyps rex*. The latter genus and species is hereby officially cremated. Two members of the family of old vultures, heretofore unknown in the western hemisphere, have been described (Miller, 1916b). The species *Pavo californicus* Miller has been assigned to a new genus, *Parapavo* (Miller, 1916a), intermediate between the old world *Pavo* and the new world *Agriocharis* of Yucatan. The anomalous walking eagle, *Morphnus daggetti*, has been described (Miller, 1915) as analogous and not homologous with *Serpentarius* of South Africa.

*Gavia*, *Ajaia*, *Plegadis*, *Geococcyx*, and two species of the Columbidae, listed as lipotypes in 1912, have been added to the Pleistocene fauna. The meager remains first assigned to *Polyborus tharus* are considered, after study of more abundant material, to belong to the species *P. cheriway*. *Botaurus lentiginosus*, *Grus americana*, *Accipiter cooperi*, and *Falco columbarius* have been added to the California list of Pleistocene species. The species *Agelaius gubernator*, *Xanthocephalus xanthocephalus*, *Euphagus cyanocephalus*, and *Otocoris alpestris* are considered best dropped from the rolls at present. Although the Pleistocene remains studied are not distinguishable to the writer's eye from the four above-mentioned local birds, it is assuming too much on his part to assert the identity thereof. The identity is not considered proven. More complete material representing the Recent falcons makes it seem advisable to drop *Falco peregrinus* and add *F. mexicanus* in its stead.

Eliminating tentative assignments from the list, there are now known some sixty-four species of birds from Pleistocene horizons, and one from the Miocene, of California. The state of Oregon exceeds this record by some five or six species.

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*Southern Branch, University of California, Los Angeles, California, May 10, 1921.*

## FROM FIELD AND STUDY

**On the Acorn-storing Habit of Certain Woodpeckers.**—In a recent article in the *CONDOR*, Dr. William E. Ritter gives an interesting discussion of the habit of the California Woodpecker of inserting acorns and sometimes pebbles into small holes drilled for their reception in the bark and dead wood of trees. During a two years stay in British Honduras the writer had a good opportunity to observe this same curious instinct in a closely related form, *Melanerpes formicivorus albeolus*. These extremely industrious birds not only store acorns in the same manner as the California Woodpecker, but also deposit them in great quantities in hollow trees and similar places. I have seen a hollow pine tree with a cavity six to eight inches in diameter filled for a distance of nearly twenty feet with acorns dropped into a good sized hole at that distance above the ground. Acorn-filled trees of this sort I found not uncommon. Sometimes an opening at the bottom showed the earlier acorns deposited, completely decayed and crumbling to dust. They must have been there for several years, and probably were not brought by the same birds that completed the accumulation. I often saw the woodpeckers bring the acorns and drop them into these "acornaries".

I lived for some time in an old house in which the roof of an upper veranda had been supported by timbers six inches square. These had been injured by termites and rendered unsafe, and had then been boxed with heavy boards of the proper width. Later the termites had completed their work of destruction and had almost entirely removed the timbers, leaving the hollow boxing. The woodpeckers had made holes near the tops of some of these and used them for acorn storage. One that I noted was filled for a distance of at least four feet, as could be seen where the boards had sprung apart slightly, and possibly much farther.

In these cases it would be utterly impossible for the birds ever to make use of the acorns in any way, yet they go on generation after generation laboriously gathering them. Furthermore, in an even, tropical climate like that of British Honduras, where there can be but little variation in food supply from season to season, it is difficult to see how, under any circumstances, such a habit could be of any great advantage; but even granting that it is so in cases where the accumulation is accessible, these instances show how an over-developed instinct may lead to actions not only useless but highly absurd.

So far as the California Woodpecker is concerned, Dr. Ritter's conclusions are in all probability correct. This suggests the possibility that the Central American bird was derived from the more northerly form or from northern ancestry, which acquired the instinct under conditions like those now existing in California, and that, as it pushed gradually into the tropics, it retained the instinct long after it had ceased to be of any utility. Such speculations, however, are of doubtful value.—MORTON E. PECK, *Willamette University, Salem, Oregon, June 8, 1921.*

**The Brown-headed Nuthatch in Oklahoma.**—The Brown-headed Nuthatch (*Sitta pusilla*) does not seem to have been heretofore recorded from Oklahoma. On July 5, 1920, I saw one bird of this species on a southern yellow pine near Cedar Creek in Pushmataha County. Although the specimen was not taken, there could be no doubt as to its identity since I had ample opportunity to study the bird at close range through field glasses; and, moreover, this locality is well within its expected range, as it has been found in Texas, Arkansas and Missouri.—MARGARET M. NICE, *Norman, Oklahoma, April 7, 1921.*

**The Water Ouzel in Arizona.**—The scarcity of published records of the occurrence of the Dipper, or as I would personally prefer to call it, the Water Ouzel (*Cinclus mexicanus unicolor*), in Arizona seems to make it desirable to add to these records. On first coming into southern Arizona a few years ago from a locality where I had come to know this bird well and to expect it along the tumbling mountain streams, I confidently looked for it along the principal permanent stream in the Santa Catalina Mountains, but was disappointed. It did not appear to be present either in the lower portion of this canyon (Sabino) or along the headwaters and upper stream where the eastern brook trout has been successfully introduced, and where conditions appeared

to be favorable for this stream-loving bird. Its absence from the Herbert Brown collection, now in the University of Arizona Museum, led to looking it up in Swarth's "Distributional list of the Birds of Arizona" (Avifauna No. 10) where the paucity of published records is noted. Thereafter, whenever opportunity offered, I have attempted to locate this species.

My search was first rewarded in June, 1917, when, on a fishing trip to Oak Creek Canyon eighteen miles south of Flagstaff, I was delighted to see my old friend of former years. At least two individuals were noted, but as they flew back and forth up and down stream all during the day of sport they seemed like a dozen. The number was not possible to estimate accurately except by laying off the trout fishing, which was even a rarer treat in Arizona than the sight of the Water Ouzels; but I should say there were not more than one or two pairs in the portion of the stream fished. While no nest was discovered, the conditions were so favorable and the birds so evidently at home, that I doubt not they breed there.

I did not personally see this species again until June 13, 1920, when the day was spent in Sabino Canyon. During the day a portion of the canyon some two miles in length, from eight to ten miles up from the mouth, was explored, and in the course of the day two birds, presumably a pair, were seen. No evidence as to their nesting was obtained, though from the general non-migratory character of the bird one would assume that they were at home, and especially at that time of the year. (In Utah the Dipper may be seen at any time of the winter along the rushing and consequently unfrozen parts of the streams of the Wasatch Mountains). That portion of the Sabino explored last June lies between the upper and lower portions which I had previously seen, and it is quite possible that in this portion the bird may be a regular resident. If this be true then we have a resident pair of Dippers within twenty-five miles of Tucson.

In the meantime I had talked of this bird to Mr. M. E. Musgrave, Predatory Animal Inspector of the Biological Survey for Arizona, suggesting that he be on the lookout for it in his more extensive travels about the State. Mr. Musgrave now kindly furnishes the following Arizona records:

"During the year 1918 along Oak Creek; also during the same year along the Black River and its tributaries east of Fort Apache, Arizona; and one on Beaver Creek near Montezuma's Well, north of Camp Verde. In June, 1920, along the White River, about ten miles east of Cooley, and a few days later two pairs nesting on a small creek known as Trout Creek, which is a tributary of White River and which comes in south-east of Cooley about five or six miles; also in the same month several of these birds along White River south as far as the Indian Saw Mill, below Cooley about ten miles. On February 1, 1921, one on Lime Creek, a tributary to the Verde River, about forty miles north of Phoenix."

Taking these records in connection with those gathered by Swarth, it seems reasonable to assume that the species under consideration occurs rather commonly along the mountain streams of the northern and northeastern high plateau and mountain region of Arizona, while its occurrence in the ranges of the southern part of the State is either sporadic or limited to a few individuals here and there along the most favorable streams, there being at present one record each for the Huachuca, Chiricahua, and Santa Catalina mountains. The streams in the Catalinas and Santa Ritas, and probably also in the Rincons, are decidedly barren of such aquatic insect nymphs as Plecoptera (stone flies) and Ephemerida (may flies), on which the Utah Dippers appeared to me to feed largely. These streams are also rather barren of caddis worms (Trichoptera larvae) which would seem to offer a good food supply for these birds, but on which I have not actually observed them feeding.

After the above was written, but before mailing the manuscript, I had occasion to again visit Sabino Creek at the point where the two birds were observed last June. It was with the keenest pleasure that I again noted on that date, March 22, 1921, the presence of two individuals of this species at the precise pool where I first saw one in June, 1920. These two kept in close company and are doubtless a resident pair. If opportunity permits, an attempt to discover them nesting will be made this season.—

CHARLES T. VORHIES, *Tucson, Arizona, March 30, 1921.*

**The Harlequin Duck in Montana.**—In the recent excellent "Distributional List of the Birds of Montana" by Aretas A. Saunders (Pacific Coast Avifauna, no. 14, pp. 38-39), are given eight records of the occurrence of the Harlequin Duck (*Histrionicus histrionicus*), which seem to indicate that the species is rather generally dispersed in the state. Three of the localities mentioned, Chief Mountain Lake, Iceberg Lake and Upper Two Medicine Lake, are within the boundaries of the Glacier National Park. Incidentally it may be noted that through a typographical error the reference for the Chief Mountain Lake record is given as the *American Naturalist* instead of Coues' "Birds of the Northwest" where it was actually published. The second record, that of a pair of birds collected by G. H. Trook on the Hayden Survey in May, 1860, belongs to Wyoming east of Jackson Hole, Wyoming, as explained in *The Auk*, vol. xxx, January, 1913, p. 107. Trook who obtained the specimens was in Wyoming in May, although later in the season he worked in the Big Horn Mountains, Montana. This leaves Merrill's record in the Big Horn Mountains, Sloanaker's record for Flathead Lake south of the Park, Saunders' record for Birch Creek, Teton County, and Thomas' record for the West Gallatin River in the southern part of the state, as the only records outside the Park.

Since Mr. Saunders' manuscript was prepared, several additional records for the Park have been published, which may be found in Mrs. F. M. Bailey's "Birds of Glacier National Park", pp. 124-126, issued by the National Park Service in 1918. These records indicate the presence of the Harlequin Duck on Mineral Creek, McDonald Creek, North Fork of the Flathead, Grinnell Lake, in Olsen Valley, on Gunsight Lake and at McDermott Falls. At present, records for localities outside the Park are more desirable than ever.—T. S. PALMER, *Washington, D. C., May 8, 1921.*

**Oklahoma Field Notes.—Protective Coloration in Gnatcatcher Nests.** The Blue-gray Gnatcatcher (*Poliophtila caerulea caerulea*) in the vicinity of Tulsa, Oklahoma, normally nests in early May. Out of a large number of nests examined by me all but one were located in the common oak of this region. At the time of nesting the oak is always in leaf and the nests are placed in proximity to clusters of leaves. They are also always covered exteriorly with dark sooty gray lichens picked from the oak limbs and are evidently so decorated in order to be inconspicuous. Interiorly the nests are lined with dark-colored fibrous material and shreds of bark. On April 27, 1919, I found a nest which departed in every particular from the usual type. It was of course earlier in the season and the oaks were not as yet in good leaf. This nest was located high up in a slender fork of a small limb in an elm which had just completed budding. The nest was entirely decorated with the red-brown bud sheaths, brown lichens and brown fibrous material. Interiorly the color scheme had been carried out also by the use of red-brown spongy cotton-like material and some silky brown seed filaments from some weed. In addition there were several brown breast feathers of the Bobwhite and other softer feathers of unknown source. The eggs, five in number, were normal in size, shape and coloration. This nest was thus unusual in its early date, in its location in an elm, in the outer and inner coloration, and in being lined partially with feathers—I have never before seen a Gnatcatcher nest lined with feathers. It was in toto a beautiful example of protective coloration, as it blended extremely well with the brown bark of the young limbs of the elm.

**Dove Nesting in Thrasher Nest.** On May 11, 1919, at Chanute, Kansas, I found a nest of the Brown Thrasher (*Toxostoma rufum rufum*) containing two eggs and located a few feet above the ground in an osage orange tree. On May 16 I again visited the nest, intending to collect a full set, but was surprised when I arrived to note a Dove (*Zenaidura macroura marginella*) resting in the nest. On the Dove being flushed I found the nest to contain the original (supposedly) Thrasher eggs and in addition two Dove eggs! No later visits were made, so it was not learned what the ultimate disposition of the four eggs and fledglings, if any, might have been.

**Abnormal Eggs of Crow.** On March 20, 1921, while collecting near Tulsa, Oklahoma, in company with Mr. G. A. Abbott, we flushed a Crow (*Corvus brachyrhynchos brachyrhynchos*) from its nest in a small pecan tree. My attention was immediately attracted to the large size of the Crow, for it was by far the largest individual I had ever seen. On climbing to the nest I found it to contain a fine set of five very large eggs. Upon measurement I find them to average 2.00 by 1.25 inches, which shows them to be slightly larger than the average egg of the Raven. The average size of Crow eggs is given as 1.60 by 1.15 inches.



*Abnormal Egg of Western Lark Sparrow.* In my collection is a set of eggs of the Western Lark Sparrow (*Chondestes grammacus strigatus*) taken on June 26, 1920, at Claremore, Oklahoma, which contains two normal eggs, one normal Cowbird egg, and one extremely large Lark Sparrow egg. This large egg is marked similarly to the other two and measures .95 by .67 inches. Reed gives the average size of eggs of this species as .80 by .60 inches.—J. R. PEMBERTON, *Tulsa, Oklahoma, April 13, 1921.*

**Relative Dimensions of Aeroplanes and Hawks.**—It has been the writer's experience that the majority of the hawks observed by bird students are seen in flight, usually outlined against the sky. The proportional dimensions of a bird can usually be made out, but it is often impossible even for an expert to be sure about the color or markings, especially when the bird is seen against a strong light. We say that a Cooper Hawk has a long tail or that another hawk has long wings, but these members are long or short compared with—what? It would certainly be more exact to say that in the Cooper Hawk the length (the distance from tip of bill to end of tail) is 60 percent of the spread of the wings.

It is a well-known fact that female hawks are larger than males; but measurements show that the ratio of length to spread is about the same in both sexes. This matter of proportion appears to be constant in any given species, irrespective of sex and age, in all full-feathered individuals. Using the ratio of length to spread as a basis, we find that the various species of hawks found in California may be readily separated into two groups, those that have a length *greater than one-half of their spread* and those that have a length *less than one-half of their spread*. With the exception of the falcons, we may safely say that the harmful species can all be placed in group 1 and the beneficial species in group 2. For example, the Cooper Hawk, regarded everywhere as harmful, has a length 60 percent of its spread, while the beneficial Swainson Hawk has a length that is only 40 percent of its spread. (See accompanying table for further figures.)

TABLE SHOWING RATIO OF LENGTH TO SPREAD IN VARIOUS SPECIES OF HAWKS AS SHOWN BY MEASUREMENTS OF BIRDS IN THE FLESH

Genus	Species	Average ratio, length to spread
Accipiter	{ Cooper Hawk .....	60%
	{ Sharp-shinned Hawk .....	54%
	{ Goshawk .....	52%
Falco	{ Sparrow Hawk .....	47%
	{ Pigeon Hawk .....	45%
	{ Duck Hawk .....	44%
	{ Prairie Falcon .....	43%
Circus	{ Marsh Hawk .....	42%
Buteo	{ Red-tailed Hawk .....	42%
	{ Swainson Hawk .....	40%
Archibuteo	{ Ferruginous Rough-leg .....	40%
Pandion	{ Osprey .....	39%

Regarding the relative proportions of aeroplanes and hawks, it may be stated that, in general, aeroplanes are relatively longer than hawks, the ratio of length to span in the former being, in ascertained cases, from 54 to 80 percent. In the recent four-passenger, Orenco type F, Tourister Aeroplane, as illustrated in *Aerial Age* of May 3, 1920, page 253, the over-all length is 25 feet, 10 inches, and the span 38 feet, a ratio of length to spread of 68 percent. The Cooper Hawk has nearly the same proportions as this modern aeroplane; and the harmful bird-hawks (Accipiters) might well be called aeroplane-hawks to distinguish them from the short-tailed squirrel-hawks (Buteos), which are beneficial.—JOSEPH DIXON, *Museum of Vertebrate Zoology, Berkeley, California, June 10, 1921.*

**A Murre Tragedy.**—The accompanying cut portrays a California Murre (*Uria troille californica*) in a very hopeless as well as helpless condition—he has been “oiled”. In the latter part of March, 1920, B. F. Hake and myself tramped from Santa Cruz to Halfmoon Bay, California, practically all the way along the beach. During this trip we saw no less than thirty-five Murres in this predicament. They were in all stages from recently oiled and in fair condition physically to badly emaciated and in many cases dead.

The plumage of the Murre is particularly susceptible to picking up the clots of floating oil that escapes from the oil carrying tankers. This material adheres to the breast feathers as is indicated by the photograph, and, what is much more disastrous, to the feathers under the wings. As a result the feathers mat, allowing the water to get through the feathers and next to the skin with the final result that the bird no longer feeds and soon dies of exposure and starvation, or, before that stage is reached, becomes the prey of the beach-combing coyote.

The oil comes from the tankers that load at various points along the coast. They are ballasted on their incoming trips by filling their tanks with water. When this is pumped out, whatever oil there happens to be left in the tank passes out and floats off to ensnare any swimming birds that happen to come into contact with it.

It is truly a pitiable sight to see these handsome and normally immaculate birds standing or sitting up on the beach or out on a rock vainly trying to preen themselves



Fig. 25. AN “OILED” MURRE.

free of this direful clinging mass; and at last, becoming too weak for further attempt, they sit stoically awaiting the end.

As a matter of interest in passing, the bird in the picture bears in his pose a suggestion of his quadruped ancestry. The use of the wings as props to help maintain an upright position, as well as to assist in propelling while on the ground, speaks in no uncertain terms of an ancestor that used the anterior organs of locomotion for feet rather than wings.

During the month of March, 1919, I spent a week at Pacific Grove and Monterey. During this time I covered many miles along the beach in the vicinity. My first impression of this locality was one of dead birds. An attempt was made to make a count of the carcasses, but after enumerating several hundred the task was given up as impossible to complete. Almost without exception the presence of the soiled and matted plumage, particularly under the wings, was ample evidence of the cause of the mortality. The list was not limited to the Murres but included practically all the birds that frequent Monterey Bay in any numbers.—R. H. PALMER, *University of Washington, Seattle*, March 29, 1921.

**Eastern California Occurrences of the Golden-crowned Sparrow.**—That *Zonotrichia coronata* is a common migrant along the eastern Sierras, is indicated by the following personally taken notes. The locality is 6700 feet altitude and just east of Sierra City, Sierra County. October 5, 1911, one immature taken and two more seen; October 6, half a dozen seen, two of which were adults; thereafter increasingly common until October 18 when they out-numbered *Zonotrichia l. gambeli* about two to one; thereafter decreasing in numbers till November 8, when one was taken. At this last date there was two feet of snow at this altitude, and open ground under heavy brush must have been difficult to find. In 1916 an adult female was taken September 23. Little time was available for collecting that year so that the single entry does not necessarily indicate any scarcity of birds. In the D. R. Dickey collection is an immature bird taken by L. M. Huey at Potholes, Imperial County, April 18, 1916. This is a short distance up the river from Yuma and is therefore practically on the Arizona line.—A. J. VAN ROSSEM, *Los Angeles, California, March 25, 1921.*

**Sparrow Hawk Captures Swallow.**—On April 26, 1921, at Stanford University, California, the following observation was made on a Sparrow Hawk (*Falco sparverius*). A number of Cliff Swallows (*Petrochelidon lunifrons*) were building, or repairing, their mud nests on the north side of the museum just under the eaves. The hawk was about one hundred yards away on the top of a young redwood tree. While we watched him he sailed gently down to one of the swallow's nests, passing over a group of about fifteen people, supported himself with one foot, hanging nearly upside down in the meantime, inserted the other foot into the nest, and extracted its owner. The captured bird was an adult Cliff Swallow. The nest was not very deep, and the opening was large. The swallow was building up the broken opening when attacked.—PAUL BONNOT, *Stanford University, California, April 28, 1921.*

**Bubo virginianus occidentalis in California.**—The Museum of Vertebrate Zoology has recently received as a gift from Mr. Carl S. Mueller, of Marysville, California, his collection of bird skins, a large proportion of them being specimens collected by himself in various parts of California. Included in this collection are two horned owls of particular interest as representative of *Bubo virginianus occidentalis* Stone, a subspecies not before recorded from California. These two birds, male and female, were taken at Shumway, Lassen County, on September 18, 1916.

Compared with specimens of *Bubo virginianus pacificus*, from the region to the westward, they are paler, more grayish in general coloration, and with much less admixture of reddish. They are also somewhat larger than the mode of *pacificus*. Compared with breeding examples of *B. v. pallescens* from the lower Colorado River and southeastern Arizona, these specimens of *occidentalis* are darker colored, they have rather heavily marked tibiae as compared with the frequently immaculate legs of *pallescens*, and they are of larger size.

Presumably *occidentalis* is the form of horned owl that breeds in the Modoc region of California, though breeding birds are lacking as yet to prove this. There are two young horned owls in the Museum collection from that part of the state which had been catalogued as *pacificus* but which are doubtless of the subspecies *occidentalis*. One was taken at the head of Pine Creek in the Warner Mountains, the other at the Scott Ranch, ten miles north of Alturas.—H. S. SWARTH, *Museum of Vertebrate Zoology, Berkeley, California, May 13, 1921.*

**Calliope Hummingbird at the Flower Show.**—Spring comes rather late in the Yosemite Valley; however, Calliope Hummingbirds arrived April 6, this year. For the first few weeks they spent their time on the north side of the valley among the early blooming manzanitas, and no birds were seen south of the river until May 14. On this date a female Calliope discovered the Flower Show in the Village.

This flower show is maintained at the Rangers' Headquarters, and though flowers may be scarce, there is always a fine floral display here. The Calliope was quick to recognize the value of the floral display, and from the day of her discovery she was a constant attendant. The "hummer" appeared not the least disturbed by the crowds of

people that gathered about the stand, but went on about her business of gathering food. She moved from flower to flower on the various shelves but gave special attention to the fiery-red stalks of the snow plant. It was noted that she was especially fond of the bright red flowers, such as *Silene californica*, *Zauschneria*, *Castilleja*, and *Pentstemon menziesii*.—C. W. MICHAEL, *Yosemite, California, June 2, 1921*.

**Dipper Nesting in Santa Barbara County, California.**—Jack Hawley of San Diego told me recently of a Dipper (*Cinclus mexicanus unicolor*) apparently nesting on a stream in Carpinteria, Santa Barbara County. I visited the spot on April 21 and saw the female enter the nest, which I found contained young about three days old. The nest is a little above where the stream emerges from the lowest ridge of the Santa Ynez range on the coast side, at an elevation of less than 500 feet. There is another pair farther up the same stream and another on the next stream, at this season, all presumably nesting.—RALPH HOFFMANN, *Carpinteria, California, April 23, 1921*.

**The California Brown Pelican as a Navigator.**—Along the coast north of San Diego the long line of bluff is of even contour, broken only by the typical sloughs which occur every two or three miles, but otherwise rises abruptly from the shore and to a height of from twenty-five to over a hundred feet. The prevailing west wind, striking this bluff, is deflected upward, and along this lane of ascending air the California Brown Pelican (*Pelecanus californicus*), in his southward migration, sails swiftly with outstretched wings and head folded back on his body.

The pelicans fly in line formation in small flocks of from five to twenty, and when wind conditions are favorable will often pass and disappear from sight without once flapping their wings. It is an interesting sight to hide near the crest of a bluff and watch them pass, and to note with what poise and little apparent effort they maintain their rapid flight, the only appreciable movement of the body being an occasional slight adjustment in response, no doubt, to the minor eddies and air currents. Occasionally a bird, feeling a desire for nourishment perhaps, which he may be carrying in his pouch for such an occasion, will raise his beak abruptly, his whole body will quiver in a momentary collapse, and then with a few quick wing-beats the bird regains his lost momentum and maintains his place in the line.

The rate of speed seems to depend directly on the velocity of the wind, and probably to some extent on the angle at which it strikes the bluff. The axis of the body is held at an angle with the shore line, with a slight deflection to windward. The phenomenon of the birds' flight is, of course, a process of volplaning down an ascending stream of air and maintaining a definite position relative to the ground. One is surprised, however, at the remarkable efficiency which they exhibit, evidenced by their high velocity in a very moderate wind, and the slight angle at which the body is held in relation to their line of flight. The position usually taken is, roughly, about 75 feet west of the crest of the bluff and about 20 or 30 feet above it. This position may vary from day to day, but at any given time one flock will follow another in very nearly the same line, the birds seeming to instinctively adjust their positions to obtain the maximum lift from the ascending air.

The Pelican is an adept navigator, the observations made above recalling to mind the common sight of the birds racing at express speed along the crest of the long rolling swells before they break on the shore, the case being practically parallel, since the wind striking the outer side of the swell is deflected upward, the angle of deflection increasing as the swell nears the shore. In this case, however, owing to the lesser height, it is necessary for the bird to barely clear the crest of the swell to obtain the desired reaction.

When one observes their apparently effortless and swift flight southward along this stretch of coast one is apt to speculate on how much of his journey the California Brown Pelican is able to make gliding "on the breast of the wind", and judging from observations in this locality I am confident that on an economy run down the coast, on a "miles per gallon" basis, our friend the pelican would be hard to beat.

We are accustomed to observing various birds taking advantage of ascending air currents in their casual flights, but a record of other birds taking such advantage

in their migrational flights would be most interesting, and I hope that others can, perhaps, give us some valuable and interesting light on this subject. At this time I would like to mention also, observations made on the actions of flocks of mixed species of gulls, which I have not previously seen recorded.

The spit of land which makes San Diego Bay a land-locked harbor terminates in two flat areas of land: Coronado Island and North Island, each 2 or 3 miles in diameter and entirely surrounded by water. North Island, in particular, presents a large expanse of level, treeless surface to the sun, and on a calm warm day a large volume of dry warm air develops over this area, surrounded by the cooler and moister air over the water. The ascension of the warm, light air over such a field is familiar to aviators, and the gulls in this vicinity seem to delight in ascending with it.

Starting two or three hundred feet up, they commence to ascend in long sweeping spirals. Their wings are extended and no perceptible motion of the body can be noted, and up, up they sail until almost out of sight, and straining the eye to follow them. They start with perhaps a dozen or two birds, but these are soon joined from all directions by other gulls in two's and three's until 100 to 200 birds are in the air at once. It is quite a pretty sight and suggests to one a column of numerous sheets of paper carried aloft by some giant whirwind, reaching upward as high as the eye can follow. They appear to sail very leisurely but they gain altitude with surprising rapidity. I have made some effort to estimate the height they attain but find it very difficult on account of the lack of anything stable in the sky with which to compare them.

When evidently satisfied with their evolutions the gulls disband, many of the birds volplaning to earth again to resume their never-ending quest for food, but others seem to use this method for gaining altitude for a long flight, perhaps to some neighboring island, as the last one sees of them as they disappear from sight, they are still sailing, with their wings outstretched, toward the distant horizon.—C. H. WOODWARD, *San Diego, California, April 16, 1921.*

**White-throated Sparrow in Orange County.**—On March 19, 1921, a single White-throated Sparrow (*Zonotrichia albicollis*) appeared in a small flock, made up of about twenty Intermediate Sparrows and a few Golden-crowned Sparrows that frequented a large pile of brush about thirty feet from our house. It was very easy to get a close view of it, from the windows, as it fed most of the time about the back-yard. It was seen nearly every day until April 10, when all of the flock left.—JOHN MCB. ROBERTSON, *Buena Park, Orange County, California, May 15, 1921.*

**Philadelphia Vireo in Montana.**—Saunders' list of the birds of Montana contains no record of the occurrence of the Philadelphia Vireo (*Vireosylva philadelphica*) in the State. A female bird was taken by H. E. Anthony, while collecting in company with the writer, near Johnson Lake, Sheridan County, Montana, on June 3, 1910. This region is rolling prairie, with only a sparse growth of boxelder, elm, and willow along the infrequent streams, and the bird was taken in one of these patches of timber. In spite of the comparatively late date, the bird was undoubtedly a migrant. The specimen is now no. 228,547, U. S. Nat. Mus. (Biological Survey collection).—EDWARD A. PREBLE, *Washington, D. C., May 13, 1921.*

**Western Bluebird Nesting on the Sea-coast.**—The published accounts of the breeding of the Western Bluebird (*Sialia mexicana occidentalis*) on the coastal plain are so few that the following note may be worth recording. There are at this writing (May 15, 1921) at least four pairs of Bluebirds in Carpinteria on the narrow plain that stretches from the last foothill to the ocean, in territory less than 50 feet above sea-level. I have located two of the nests. One is probably as near the ocean as the species is likely to nest. It is in a willow, in the last group of trees between the Coast Highway and the sea, so near a salt marsh that a very high tide would come within 50 rods of the nest.—RALPH HOFFMANN, *Carpinteria, California, May 15, 1921.*

## EDITORIAL NOTES AND NEWS

The regular July meeting of the Northern Division of the Cooper Club will be postponed until Wednesday evening, August 3, 1921. This is done in order to relate the meeting to the sessions of the Pacific Division of the American Association for the Advancement of Science, which will be held at Berkeley, August 4 to 6, 1921. The business meeting of the C. O. C. will be held at 7:30 P. M., and the program will commence at 8 P. M. The two papers thus far assured are: "The Pelican Colonies of Pyramid Lake" by Barton Warren Evermann; "The Principle of Rapid Peering, in Birds" by Joseph Grinnell. Visiting ornithologists will be able to join in the various excursions which are being planned in connection with the general meetings.

Mr. and Mrs. J. Eugene Law are doing vertebrate field work again this summer in the Chiricahua Mountains, southeastern Arizona. Mr. Donald D. McLean is serving as Mr. Law's assistant, and the party keeps in touch with the outside world through the kind offices of our fellow Cooper Club member at Dos Cabezas, Mr. Frank H. Hands.

We are not infrequently called upon to recommend a few of "the best" books on birds for a beginning student to own, said student being of the type who is ambitious to qualify in due time as a serious ornithologist. Of course the number must be strictly limited and the factor of scholarly standards be kept foremost in consideration. Here are the four works we have, on occasion, nominated: Coues' "Key to North American Birds"; Newton's "Dictionary of Birds"; Pycraft's "History of Birds"; Bendire's "Life Histories of North American Birds" (with Bent's continuation of the same so far as it has appeared). Perhaps someone else will have different ideas on this score. We invite comment.

Various interesting bits of news have come to the ears of the Editors lately and some of them we hereby pass along. Mr. Harry Harris, of Kansas City, is reported to be at work upon a biographical index to the *Ibis*. There is also a persistent rumor current to the effect that Missouri is to lose Mr. Harris,—California to be the gainer. Part II of Mr. A. C. Bent's "Life Histories" is in press, and the manuscript of Part III is completed. The Treganzas (Mr. and Mrs. A. O.) are actively promoting popular interest in birds among the boy scouts, clubs, and schools of Salt Lake City. Prof.

Arthur A. Allen, of Ithaca, has had remarkable success the past spring in rearing broods of Ruffed Grouse. Mr. S. Prentiss Baldwin has recorded further startling revelations this summer concerning the domestic relations of the house wrens on his place near Cleveland. Mr. R. H. Beck is giving a good account of himself among the South Sea islands, whence he has already shipped in to the American Museum of Natural History several consignments of rare bird skins.

### PUBLICATIONS REVIEWED

SAUNDERS ON THE BIRDS OF MONTANA.\*—This report, the first complete notice of the birds of Montana, consists mainly of an annotated list of all species of recent birds known to have occurred within the State. The main list numbers 332 species and subspecies, including all currently recognized indigenous forms known to occur. Species noticed under secondary headings are as follows: Recently Extinct Species, one (Passenger Pigeon); Introduced Species, four; and Hypothetical List, thirteen, species which have been recorded but the status of which is questioned, owing to possible errors in identification. There is also presented a supplemental list of nine subspecies which have been described but are not generally considered as valid.

We consider this report to be one of the best lists ever prepared for a western State. The allocation of old records, by no means an easy matter, seems to have been exceptionally well done, and the very large amount of field work accomplished by the author places to his credit a much greater proportion of the notes than is usual in such undertakings. Its appearance places the ornithology of Montana on a basis far in advance of similar work in any other of the larger and more sparsely settled States, with the exception of Arizona, and many years are likely to elapse before a more complete exposition of the bird life of the State appears.

The introductory part comprises about twenty-five pages. The introduction proper,

\*A Distributional List of the Birds of Montana, with Notes on the Migration and Nesting of the Better Known Species. By Aretas A. Saunders. Pacific Coast Avifauna, No. 14. 194 pages; 1 map and numerous figures. Published by the Cooper Ornithological Club, Berkeley, California, Feb. 1, 1921.

occupying about four pages, relates to the author's own work and the other sources which contributed to the results. We learn that Mr. Saunders spent nearly five years of almost continuous field work, with two additional summers, in various sections of Montana. The main results of much of this work have already appeared from time to time. The author also acknowledges important assistance gained from manuscript reports furnished by a number of ornithologists resident in various parts of the State, some of these representing several years' observation in their respective sections. The more important of these lists and the sections covered are as follows: Bernard Bailey, Bitterroot Valley; A. D. Dubois, Dutton and Belton; Joseph Kittredge, Jr., Missoula and elsewhere; Nelson Lundwall, Gallatin Valley; J. L. Sloanaker, Kalispell and Flathead Lake; Gerald B. Thomas, Billings and Lake Basin; and C. F. Hedges, Miles City. Of these, the last two contributed notes on several forms not otherwise known from the State.

A bibliography is presented listing more than 200 titles, arranged by authors alphabetically, and chronologically under authors. Of the articles cited 33 are by Saunders and 22 by Silloway. Among earlier important works which are omitted from the bibliography may be mentioned the articles by Captain Blakiston on birds collected in the interior of British America, published in the *Ibis*, 1861-63; and the report by George M. Dawson of the British North American Boundary Commission, 1875. We miss also, both in the bibliography and in the accounts of many species, references from Mrs. F. M. Bailey's annotated list of the birds of Glacier Park, issued by the National Park Service, January 10, 1919. This report contains many detailed notes on nesting and migration not given in the brief list in the circular which is cited.

We regret that the author has failed to include in his introduction accounts of the more important of the early expeditions which traversed the State. Thus the famous journey of Lewis and Clark in 1804-5, during which Montana was crossed on both the outward and homeward trips, resulted in the discovery of three notable species of birds, and of these at least two (Lewis's Woodpecker and Clark's Crow) were first seen in western Montana (though the actual type specimens were taken in Idaho), yet we look in vain for any mention of these important facts, either in the introduction

or in the separate accounts of the species.

Similar lack of detailed treatment obtains with reference to *Cyanocitta stelleri annectens*, from Hell Gate River, east of Missoula; *Cyanocephalus cyanocephalus*, from the junction of the Marias and Yellowstone Rivers; *Ammodramus bairdi*, from near Fort Union, situated on the north bank of the Missouri exactly on the line between North Dakota and Montana; *Junco hyemalis montanus*, from Columbia Falls; *Pinicola enucleator montana*, from Bear Creek, Gallatin County; and *Penthestes atricapillus septentrionalis*, from the Yellowstone about 30 miles above its junction with the Missouri. In some of these cases, however, information as to type localities may be found in the annotations in the bibliography. We can hardly blame the author for failing to undertake the drudgery of compiling accounts of these expeditions, although we consider them important in a work of this kind, but surely the fact that the first known specimen of a given species came from the State deserves mention under its proper heading. An examination of the narratives of journeys would also have prevented the inclusion under *Mergus americanus* of the upper Powder River and Deer Creek records, under *Querquedula cyanoptera*, of the Popo Agie River note, and under *Histrionicus histrionicus* of the Troom record, which refers to the Wind River Mountains (see Palmer, *Auk*, xxx, p. 106), all relating to localities well down in Wyoming.

The annotations generally consist, in the case of the commoner species, of a brief summary of the status of the bird in the State, whether permanent resident, summer resident, regular migrant, or casual visitor, together with dates of arrival and departure, notes on nesting, habitat, zonal distribution, and other items of interest. The notes are in the main well selected and to the point. Each species is treated under the scientific name, and usually under the common name, given in the 1910 edition of the A. O. U. Check-List. We note, however, that in some cases vernacular names are used which seem more appropriate than the official A. O. U. names. An example is Eastern Bluebird, instead of Bluebird, for *Sialia sialis*, which seems a reasonable change, "from the standpoint of a resident of Montana, where *Sialia currucoides* is the Bluebird." We join the author in the hope that similar changes in the common names of many species will be made in the next edition of the Check-List.



Citation of references is by the popular method of indicating a title in the bibliography by a key reference consisting of the author's name, with date of the article and the page. The care necessary to prevent errors by this method is shown by the fact that in some way the key reference to Coues' report on the birds of the 49th parallel (1878) has been confused with that of an earlier work, with the result that in dozens of cases the notes are wrongly credited to his article in the American Naturalist on the nesting of certain hawks. This error apparently runs through the entire work, with few exceptions.

The accounts of *Empidonax traillii* and *E. alnorum* evidently were not written in the light of the recent studies of Oberholser, which resulted in the former name being shifted to the eastern form, and the consequent renaming of the western species. However, since the nomenclature throughout is understood to be that of the 1910 Check-List, this course is probably the more sensible one. We would suggest that the standard set in other cases would seem to favor placing Krider's Redtail in the Hypothetical List; we also question the advisability of allowing more than one form of the Blue Grouse for the Bighorn Mountains.

The locality, Silver, Missoula County, where a specimen of Vaux's Swift was collected in 1891, is on the St. Regis River a few miles southeast from St. Regis Pass, and is now known as Saltese. The writer has a recollection of hearing of this change of name many years ago, but has been unable to find the name Silver on any available map. This is an example of the great difficulty experienced in locating places the names of which were formerly in common use but which have become obsolete.

The only species which occurs to the present writer as having been taken in Montana and not included in the list is the Philadelphia Vireo, a specimen of which was taken by H. E. Anthony at Johnson Lake, north of Culbertson, Sheridan County, June 3, 1910; it is formally recorded elsewhere in the present issue of THE CONDOR.

Distributional areas are divided into three categories, faunal, zonal, and associational, and as far as we are qualified to judge, the subject is well handled. We are inclined, however, to question the value of mentioning some of the less well-defined associations. Associations seem to furnish a subject so elusive, and yet so alluring, that an author is tempted to indulge in intricate and some-

times tedious discussions to account for the presence of species, when in fact the reason for such presence is self evident or the explanation tells only half the story. An example of the latter kind is the citation of the Northern Pileated Woodpecker (i. e., the eastern form) as a characteristic species of the Yellow Pine Association west of the Continental Divide. This treatment is explained in the main account of the species, and while the subject appears to be conclusively treated from the standpoint of a State list, we are tempted to pursue it further. The Pileated Woodpecker is, as far as we know it, an inhabitant of *heavy forests, either deciduous or evergreen*, wherever they occur in sufficiently large and continuous areas to afford the bird protection and an adequate food supply. The species is thus a resident of the better-developed or better-preserved parts of the eastern forested region from the Atlantic Coast to the Mississippi Valley, and from Florida to southern Canada. The bird is naturally absent from the Great Plains, and where the northern edge of this vast treeless area impinges on the great transcontinental forest, carrying its influence far northward and combining forces with adverse geological and climatic conditions so effectively as almost to bisect that great expanse of woods, as far as really heavy forests are concerned, the ranges of the eastern and western Pileated Woodpeckers are apparently separated (excepting one record) by a space of five hundred miles from Lake Winnipeg to the lower Athabaska River. In the valley of this stream, the fertile soil of which, aided by a climate somewhat tempered by periodic mild trans-montane influences, induces a heavy forest growth, we again meet with this magnificent woodpecker. From this section north to the Liard, and west to the Pacific, its range is practically continuous wherever suitable forests occur, and there is but little interruption. From British Columbia southward, the range of the bird is confined mainly to the country west of the Rocky Mountains, including the area in question in western Montana. Theoretically then, all the birds of this northwestern area should be closely related, and we believe that this is the case and that the individuals living in western Montana and throughout the west Canadian range will be found to be referable to *Phloeotomus pileatus picinus*, if indeed this race, which seems to be but slightly differentiated, be considered worthy of recognition.

The map leaves much to be desired, but taking into consideration the number of things it purports to show, it does well. However, it is a good example of what happens when one attempts to represent the salient features of a great State on a single page. It simply can not be done.

It is to be regretted that the relatively trivial errors and omission which we have indicated should appear in a work of such a generally high standard of excellence, but they should not be construed as reflecting seriously on the results of an undertaking based so largely on original investigation of a high order of merit, and representing an amount of painstaking study which can be fully appreciated only by those who have attempted similar labors.—EDWARD A. PREBLE, *Biological Survey, Washington, D. C., May 13, 1921.*

EVERMANN AND CLARK ON THE FAUNA OF LAKE MAXINKUCKEE.\*—"The Birds" occupy a relatively unimportant position in this comprehensive report (pages 481 to 579 of the first volume) as compared with certain other groups of animals or plants, but there is, nevertheless, a great deal that is of interest and value here placed on record regarding the species treated. One hundred and seventy-five species and subspecies are listed (305 are attributed to the entire state in Butler's *Birds of Indiana*), those given in greatest detail being naturally the water birds and those most closely confined to lacustrine or riparian surroundings. The lakes and rivers of northern Indiana in years past formed a veritable hunter's paradise and although the myriads of water fowl have since been sadly reduced in quantity, we can still see in the numbers of species represented at least an indication of former conditions.

The accounts of the birds are written in Dr. Evermann's pleasing and unhackneyed style, with the spirit of the enthusiastic collector cropping out in many places.

Residents of Indiana have available in this report a store of detailed and authentic information pertaining to the natural history of the northern part of the state. Lovers of nature from other sections should derive a great deal of pleasure from the narratives relating to various of the species

concerned, even though unfamiliar to the reader. Incidentally it may be suggested that even an ornithologist can find much to enjoy in some sections of the book relating to things other than birds, such as the parts that deal with the reptiles and fishes.—H. S. SWARTH.

## MINUTES OF COOPER CLUB MEETINGS

### SOUTHERN DIVISION

FEBRUARY.—The regular meeting of the Cooper Ornithological Club, Southern Division, was held at the Southwest Museum, together with the Bird Lovers' Club, at 8 p. m., February 24, 1921. The special feature of the evening was the exhibition of a large number of excellent lantern slides, mostly of birds and nests, by President Dickey. This entertainment was enjoyed by an enthusiastic audience of some sixty members of the Cooper Club, Bird Lovers' Club, and the Audubon Society.

Followed the business meeting, at which Dr. Miller presided, at the request of President Dickey. Minutes of the January meeting were read and approved, followed by reading of minutes of January meeting of the Northern Division. January membership presentations received favorable action, on motion of Dr. Rich, seconded by Dr. Bishop. New names were: W. B. Purdy, Milford, Mich., by Wright M. Pierce; Mrs. C. E. Raymond, Hinsdale, Ill., and H. H. T. Jackson, Washington, D. C., by W. Lee Chambers; William Warren Moore, Eureka, by John M. Davis; William Rowan, Edmonton, Alberta, Canada, by W. L. Chambers; Walter Cunningham, Kansas City, Mo., by Harry Harris; Dr. Frances Louise Long, Helen S. Nicholson, and Herschel Vincent Hibbard, Tucson, Ariz.; also Mrs. M. F. Musgrave, Phoenix, Ariz., by Charles T. Vorhies.

Dr. Miller announced that Mr. W. L. Finley will exhibit moving pictures of birds at the March meeting of the Club, and extended an invitation to all present to attend that meeting. Informal discussion of bird matters completed the session.—L. E. WYMAN, *Secretary.*

MARCH.—The regular meeting of the Southern Division, Cooper Ornithological Club, was held in the assembly room of the State Exposition Building, Exposition Park, at 8 p. m., March 31, 1921. President Dickey was in the chair, with an audience of 150, among whom were 35 club members.

\*Lake Maxinkuckee, a physical and biological survey. By Barton Warren Evermann and Howard Walton Clark. Published by the Department of Conservation, State of Indiana, 1920. Vol. 1, 660 pp., 32 halftones, 36 colored pls., 23 text-figs., 1 map; vol. 2, 512 pp.

On proper motion the entertainment feature of the evening preceded the business meeting. This consisted of a lecture, illustrated by wonderful moving pictures of birds and mammals, by Mr. W. L. Finley, and was hugely enjoyed by all present as being not only entertaining but highly instructive.

Followed a short recess, when formal business was taken up. Minutes of the previous meeting were read and approved, while reading of those of the Northern Division was waived. New presentations were as follows: Mrs. Delpha S. Miller, Glendale, by Loye Miller; Frederick Norman Gallup, Escondido, by C. S. Sharp; Max Walker de Laubenfels, La Grange, Ill., by W. Lee Chambers; Delacourt Kell, Claremont, by Wright M. Pierce. The Northern Division sent the names of Ella B. Drummond, Berkeley; J. W. Winson, Huntington, B. C.; Lionel V. Taylor, Kelowna, B. C.; Kenneth Racey, Vancouver, B. C.; Carroll McGettigan, San Francisco.

The resignation of Mr. Howell as vice-president was tendered and accepted on motion of Dr. Rich, seconded by Mr. Chambers. Nominations of Dr. Rich and Mr. Pierce to fill the vacancy brought the withdrawal of the former; and on motion of Dr. Miller the secretary was instructed to cast a favoring ballot for Mr. Pierce, who was declared elected.

Messrs. Chambers and Miller were named to assist the president in formulating resolutions on the death of John Lewis Childs, on motion of Dr. Miller that the chair appoint a committee of three, including the chairman, for this purpose. A motion by Dr. Miller, seconded by Mr. Little, that the executive committee be designated as the official committee on entertainment, was unanimously carried. Adjourned.—L. E. WYMAN, *Secretary*.

APRIL.—The regular monthly meeting of the Cooper Ornithological Club, Southern Division, was held April 28, 1921, at 8 P. M., at the Museum of History, Science and Art. President Dickey presided. About fifty members and friends attended. The chief feature of the evening was a talk by Dr. L. H. Miller on Notes of Birds. This was amply illustrated by imitations of bird calls and songs, and was thoroughly enjoyed by all present.

Following a brief recess, minutes of the March meeting were read and approved. New applications for membership were: Brasher C. Bacon, Madisonville, Ky., by D.

Bernard Bull; Clarence Abram Barnes, Los Angeles, by W. Lee Chambers; and R. W. Limbert, Boise, Idaho, by George Tonkin. A communication from the vice-president of the California Art Club, relative to a contribution by the Cooper Club to a proposed fund to erect a memorial to the late F. S. Daggett, was presented. On motion by Mr. Law, the secretary was instructed to advise the writer that the Cooper Club had no fund available for that purpose, and to transmit the names of individuals who might wish to contribute.

A request, from the Atascadero Chamber of Commerce, for the Club's endorsement of a proposed "bird pageant", was tabled pending further information on the subject, and Mr. Chambers was requested to investigate and report at a later meeting.

The committee on resolutions on the death of Mr. Childs reported as follows:

Whereas, science, if it is to function fully, must of necessity enroll in its support not only the trained specialist, but, equally, the scientific enthusiast who brings much of his heart, although but part of his time, to its service; and

Whereas, in the passing of the late John Lewis Childs the Cooper Ornithological Club has lost a member who filled that latter niche in Club affairs with peculiar force, who stood always ready to give unstintingly of constructive suggestion or material aid in a degree which only those who piloted the Club through early years can ever fully know, who was at once an inspiration to some of us in student days and later a reliance to some, in furthering our scientific ends, but who was to us all a fellow member who brightened many meetings with a quiet charm we will not soon forget;

Now, therefore, be it resolved, that the Southern Division of this society spread upon its minutes this expression of admiration for his life,—of heart-felt bereavement in his death.

On motion of Dr. Miller, seconded by Mr. Appleton, the report was accepted by a rising vote.

A brief informal discussion of bird matters completed the session. Adjourned.—L. E. WYMAN, *Secretary*.

MAY.—Regular meeting of the Southern Division, Cooper Ornithological Club, was held at 8 P. M., May 26, 1921, at the Museum of History, Science and Art. In the absence of President Dickey, Vice-President Pierce occupied the chair. About thirty members and friends attended.

The formal business meeting was preceded by an address on the "Evolution of the Hawaiian Bird Fauna", by Prof. William Alanson Bryan. Prof. Bryan is an authority on the subject, by virtue of long resi-

dence in those islands and extensive study of their fauna, and his talk was appreciated by all.

Business matters were taken up after a brief intermission. Minutes of the April meeting were read and approved. Minutes of the Northern Division were read by title only. Applications for membership were presented as follows: W. A. Hilton, Claremont, Calif., by Wright M. Pierce; Mrs. G. H. Schneider, by Helen S. Pratt; Wm. Alanson Bryan, Los Angeles Museum, Exposition Park, by L. E. Wyman; Lieut. L. R. Wolfe, 64th U. S. Infantry, Camp Meade, Md., by W. Lee Chambers; Frances Vermilyea Barnes, by W. Lee Chambers; Miss Dorothy K. Austin, Pasadena, Calif., by Miss Ethel K. Crum. The Northern Division sent the names of Miss Florence Van Gassbeek and Charles H. Baker.

A communication from the Secretary of the Pacific Division of the A. A. A. S. relative to the annual meeting was presented and the secretary instructed to acknowledge receipt and advise that the Northern Division would represent the club in the matter of arrangements.

A letter from the Librarian of the Los Angeles Public Library soliciting support at the coming election in the matter of a bond issue for a library building was read and ordered filed. A further communication from the Atascadero Chamber of Commerce relative to endorsement of a proposed bird pageant was considered unsatisfactory, and on motion of Dr. Miller, seconded by Mr. Brown, was likewise ordered filed.

Followed the usual round of informal discussion of bird matters, during which the abnormal bird movement and nesting was generally commented upon and ascribed to the abnormal season. Adjourned.—L. E. WYMAN, *Secretary*.

#### NORTHERN DIVISION

APRIL.—The Northern Division of the Cooper Ornithological Club met at the Museum of Vertebrate Zoology April 28 at 8 P. M. President Wright presided, and the following members were present: Mesdames Allen, Ayer, Bamford, Blake, Boyle, Burk, Drummond, Flinn, Van Gassbeek, Griffin, Grinnell, Mead, Neugass, Pitcher, Reygadas, Roe, Schlesinger, Woodruff; Messrs. Bell, Carriger, Dixon, Evermann, Kellogg, Lastreto, Storer, Swarth, and Wheeler; Visitors, Miss Beaman, Miss Cassidy, Mrs. Evermann, Miss Kellogg, Mrs. Wheeler, and Messrs. Baker, Miller, and Farber.

[The March meeting of the Northern Division was held informally in Golden Gate Park; no business being transacted, there were no minutes filed.]

The February and March minutes of the Southern Division were read. Names proposed were: George R. Field, Requa, Del Norte Co., by Tracy I. Storer; Mrs. Minnie Buhn, Alameda, Miss Dora H. Shinn, San Mateo, and Chas. H. Baker, Oakland, by H. C. Bryant, and Miss Florence Van Gassbeek, Berkeley, by Mrs. Georgia T. Roe.

A letter from the secretary of the Pacific Division of the A. A. A. S. announcing preliminary arrangements of the meeting to be held in Berkeley in August was read by the secretary. It was voted that the president appoint a committee on entertainment to cooperate with the general committee of the University. Mr. Baker presented an offer of a prize to consist of \$50 to \$100 to be offered for the best essay written by a student in the University on some subject connected with economic ornithology. The secretary was instructed to forward the offer to Dr. Grinnell.

The report of the committee appointed to consider Dr. Bryant's resolution relating to the collecting of specimens, sent in a written report in favor of referring the matter to the Board of Governors. The report was adopted.

Business disposed of, Mr. Robert C. Miller gave a talk on "The Flock Behavior of the Coast Bush-tit". After discussion, the club adjourned.—AMELIA S. ALLEN, *Secretary*.

MAY.—The Northern Division of the Cooper Ornithological Club met at the Museum of Vertebrate Zoology, Berkeley, May 26, at 8 P. M. President Wright was in the chair, with twenty-one members and visitors in attendance. Minutes of the April meeting were read and approved, and April minutes of the Southern Division were read. Names proposed were: Mr. William Polk Farber, Berkeley, Calif., proposed by Tracy I. Storer; and Mrs. Mildred Tiffany Wood, Hopland, Calif., by Mrs. Eva D. Roe. Mr. Storer reported briefly on a recent article in *The Ibis* by Col. R. Meinertzhagen, upon accurate determination of the velocity of various birds in ordinary and migration flights.

Mr. H. R. Noack presented the paper of the evening, his subject being "Some Experiences with Aviary Birds". A general discussion followed. Adjourned.—TRACY I. STORER, *Secretary pro tem*.

**For Sale, Exchange and Want Column.**—Any Cooper Club member is entitled to one advertising notice in each issue free. Notices of over ten lines will be charged for at the rate of ten cents per line. For this department, address W. LEE CHAMBERS, *Eagle Rock, Los Angeles County, California.*

**STILL LACKING.**—Through exchange notice on this page, I have completed my set of the Auk. I still lack Bulletin Nuttall Ornithological Club, vol. 1, no. 2; vol. 2, no. 3. I will pay any reasonable price for a copy of either or both of these numbers.—R. C. McGREGOR, *Bureau of Science, Manila, P. I.*

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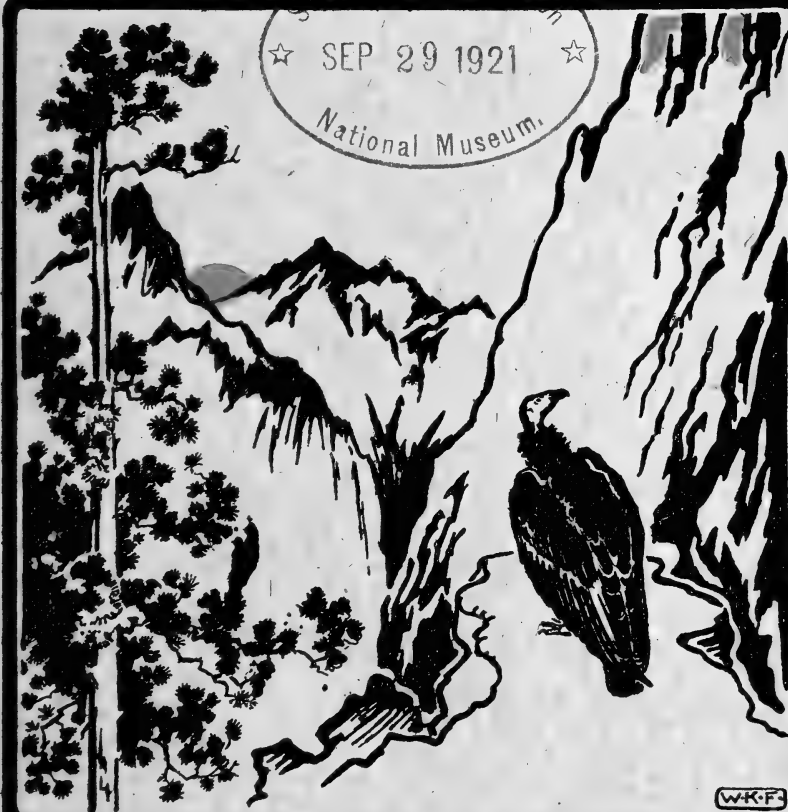


# THE CONDOR

A Magazine of Western  
Ornithology



Volume XXIII    September-October, 1921    Number 5



COOPER ORNITHOLOGICAL CLUB



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Published Bi-Monthly by the Cooper Ornithological Club

Entered as second-class matter November 29, 1919, at the post-office at Berkeley, California, under Act of Congress of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized January 5, 1921.

Issued from the Office of THE CONDOR, Museum of Vertebrate Zoology, Berkeley, California

## SUBSCRIPTION RATES

Two Dollars per Year in the United States, payable in advance.

Forty Cents the single copy.

Two Dollars and Twenty-five Cents per Year in all other countries in the International Postal Union.

## COOPER CLUB DUES

Two Dollars per year for members residing in the United States.

Two Dollars and Twenty-five Cents in all other countries.

Manuscripts for publication should be sent to the Editor, J. GRINNELL, Museum of Vertebrate Zoology, University of California, Berkeley, California.

Claims for missing or imperfect numbers should be made of the Business Manager, as addressed below, within thirty days of date of issue.

Cooper Club Dues, Subscriptions to The Condor, and Exchanges, should be sent to the Business Manager.

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Issued September 26, 1921

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Volume XXIII

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[Issued September 24, 1921]

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## NESTS OF MOURNING DOVES WITH THREE YOUNG

By MARGARET MORSE NICE

WITH TWO PHOTOS

THIS SPRING we have had the rare experience of following the course of two Mourning Dove's nests, each of which contained three eggs, and all of the eggs hatching. Although we have examined nearly 150 nests of the Western Mourning Dove (*Zenaidura macroura marginella*) here in central Oklahoma, in only one other instance have we found more than two eggs or young. This was a nest containing two small doves and one egg, discovered by my daughter Constance, May 25, 1917. Unfortunately we did not revisit this nest.

The first of the three-egg sets found in 1921 was located in a new Robin's nest that had been built in a box elder fifteen feet from the ground. It was found April 15 with three Robin's eggs in it, but on April 20 it was empty and deserted. On April 30 we saw a Dove placidly in possession, and on Constance's climbing the tree she made the exciting discovery that the nest contained three Dove's eggs, one of which looked slightly smaller than the others. On May 12 there were still three eggs; but on May 14 there was one egg and two young, one a day old and the other a few hours old; this last was under the egg. On May 18 there were three little birds; the smallest from its degree of development must have been one day younger than the middle bird.

On May 19 the six-day-old dove weighed 41 grams, the five-day-old 21.8 grams, and the four-day-old 17 grams. The weights of the two younger birds are lower than others of the same age, the average of two other five-day-old squabs being 36 grams and of two four-day-olds 30.5 grams. Apparently the three were not getting quite enough food. All, however, were well advanced as to feather development. On May 21 Dr. Joseph M. Thuringer ascended the tree and photographed the birds in their nest. After this we did not disturb them for fear of frightening them out prematurely. They left the nest at an average age for Oklahoma Mourning Doves, the oldest when 13 days old and the others the following day when 12 and 13 days old.

The second nest was situated in a crotch of an elm ten feet from the

ground; it was fairly substantial, being largely built of twigs. On May 3 there were two eggs in it. It was not examined again until May 9 when it was found to contain three eggs, one of which looked slightly yellowish. The first bird hatched May 16, the second May 17, and the third not until May 22. Therefore the nest mates of the latter had a great start, one being six days old and weighing 40.3 grams, and the other five days old and weighing 37.8 grams, while the poor infant weighed only 4.4 grams. The next day it had hardly gained at all, weighing only 4.8 grams, and the day after it was dead; it had been too tiny to compete with the big squabs. These latter birds left the nest when 12 and 13 days old.



Fig. 26. THREE YOUNG MOURNING DOVES IN A ROBIN'S NEST, 8, 6 AND 7 DAYS OLD, RESPECTIVELY.

Photographed by Joseph M. Thuringer.

At least 35 sets of three eggs of Mourning Doves have been reported, but, as far as I can learn, only four instances\* of three young in a nest. In only one of these is the comparative size of the young mentioned: They were "all of one size" (Wharram). In our two cases the only one that was entirely successful was placed in a robin's nest and the birds hatched within a day of each other; while in the other the third bird that hatched five and six days after its nest-mates lived only two days. These experiences suggest two possi-

\*Fisher, A. K. Report on the Ornithology of the Death Valley Expedition of 1891. N. Amer. Fauna No. 7, 1893, p. 33; Semmes, Jr., T. The Mourning Dove. Oologist, XXIV, 1907, pp. 8-9; Wharram, S. V. Dove's Nest. Oologist, XXXII, 1915, p. 134.

ble reasons why three squabs in a nest are such unusual occurrences: First,



Fig. 27. THREE YOUNG MOURNING DOVES FROM ONE NEST, 6, 1 AND 7 DAYS OLD, RESPECTIVELY. THESE WERE TAKEN OUT OF THE ACTUAL NEST FOR PHOTOGRAPHING.

Photographed by Joseph M. Thuringer.

the ordinary dove nest is too frail to hold three birds to maturity, and secondly, the third bird may hatch so late that it is soon eliminated.

*Norman, Oklahoma, July 15, 1921.*

## NOTES ON THE ROCKY MOUNTAIN JAY IN THE YELLOWSTONE NATIONAL PARK

By M. P. SKINNER, Park Naturalist

**A**LTHOUGH the Rocky Mountain Jay (*Perisoreus canadensis capitalis*) is known everywhere as the "camp robber", it shares this term with the Clark Nutcracker with which the former is thus confused; but the Nutcracker has markings of black and white on wings and tail not possessed by the jay, is a larger bird, and carries a much longer and stronger bill. After the differences are once recognized, it is not hard to distinguish these two camp birds. It is true also that the Nutcracker ranges through, and breeds in, a lower zone than the Jay.

While I have frequently found Rocky Mountain Jays in the smaller meadows and openings, still it is apparent they like the forests best. Forests of lodgepole pine, limber pine, fir, spruce, cedar, and even aspen groves and willow thickets constitute their chosen haunts. Their nests are in the lodgepole pine belt between the 7500 and 8000 foot levels. For some obscure reason these birds are rare about Mammoth, although common about Tower Falls at about the same altitude. Rummaging about the refuse of old camp sites, as well as about camps in actual use, they are distinctively a camp bird although I should think "camp scavenger" a rather more appropriate name than "camp

robber". For they serve as scavengers, and not as robbers of the type of magpies and pack rats. At times the numerous "bear dumps", as the localities where garbage is thrown for bears are known, attract these birds, but not enough to cause them to desert the camps entirely. Birds of the air and of the tree tops as they are, when they are on the ground they move somewhat awkwardly in a series of long hops, a little sideways perhaps, a good deal like crows and ravens.

While Rocky Mountain Jays are frequently seen on "the formations" about the hot springs and even in the Geyser Basins, it is evident they are not especially attracted there. Neither the water, nor the heat, nor the breeding insects, are of interest to these Jays.

These birds are common enough all winter about the ranger stations. In May and early June they begin visiting camps; but at that time, possibly because it is their nesting season, they are shy and sometimes indifferent to crumbs thrown out for them. Soon they become bolder, and by September are something of a pest, although they make up for this later by the touch of life they give to an otherwise cheerless and wintry landscape. At times they add very much to the amusement of a winter camp. For instance, a Jay came to my camp one snowy morning; the falling snow was too light and soft for him to walk on, but he was hungry and wanted the scraps I had thrown out. Jays are shrewd, and this one was no exception to the rule: he spread his wings whenever he wished to alight, letting his feet and body sink into the snow until the spread wings rested on the surface and supported him. True, he had a little difficulty in flying up from such a position; but after a trial or two, he seemed to acquire a knack for it.

Camp Robbers, as their nickname would imply, have bold and daring ways, especially when there is food at stake. At one camp where I remained some time I used to feed them; on the first day fifteen feet was as close as they would come; six days after that they fed unconcerned within three feet, and a day later within six inches of my hand. These were perfectly wild birds; but when I lunched one day near Apollinaris Spring, where there had been campers all summer, two Jays alighted on my head, one on my back, and one on my elbow, without any hesitation whatever.

At my Lewis Lake camp the Jays promptly came trooping in for "goodies". Two, that were a little too greedy, were soon a-fighting, and they fought each other so hard they fell to the ground and were picked up by the cook still fighting. When they found themselves caught, they squalled so loudly and piercingly as to call a dozen companions to the scene. Still, when they were released, they flew off not very much frightened and returned almost immediately.

Once I made a trip to Snake River valley "by my lonesome", and, as I unpacked, a Camp Robber and a red squirrel decided to camp, too! With marvellous unanimity they selected the same place I did! "Hello," thinks I, "here's where I shall have to watch my bacon pretty closely." I did! I saved the bacon and the frying pan, but the Camp Robber got the bacon rind and some of the grease. The Rocky Mountain Jays became so bold at DeLacey Creek camp as to enter the tents and take things off the table; one took a bit of bread from the knee of a man lying on his bed. Later I had one purloin food from a small camp table at which I was eating at the time.

Beginning on September 18, 1919, I spent a week in camp near Cold Spring, not far from the main road and within a short distance of several summer camp grounds. Four jays arrived as soon as I did, and that evening one tried to fly off with a slice of ham soaking in boiling water to remove the salt. On the morning of the 20th, I was aroused before sunrise by the scratching of jays' claws on the canvas stiffened by the night's frost. I should probably not have known what caused the disturbance, if the birds had not commenced a beseeching whine "to come out and feed us." Later during this stay, they did not wait to wake me up but came right in under the canvas where it lacked about three inches of meeting the ground. Usually I was away all day on trips in various directions; frequently I saw other Jays in the forest and even had four follow me for a mile or more along a 9000-foot ridge; the four at camp were always there when I got back, or they appeared soon after. Sometimes I found them inside the tent foraging on the floor for crumbs. The 21st of September was Sunday, and, as usual, I washed up everything in camp until the Jays stole every one of my pieces of soap! I cannot say that they ate the soap, but I do know they got away with it and hid it so effectually that I was soapless for a week. That evening at supper, a Jay tried to steal ham from the hot frying pan when I took it off to replenish the fire; another one alighted on the far end of a stick on the fire and within a foot of the blaze and actually in the smoke that was eddying about. Verily the Jays were "into everything" at that camp!

In the Yellowstone, Rocky Mountain Jays are almost always in pairs; never yet have I seen them in flocks, except for family parties. I do not think they intentionally associate with other birds; but the search for food takes them where other species, especially Nutcrackers and Black-headed Jays, are. Once I found them with Juncos, a squirrel, and two chipmunks about a little pile of oats dropped in the road. I have seen them with Red-breasted Nuthatches; and once I found two Jays and a pair of Sparrow Hawks in the last tree at timberline on Quadrant Mountain. One day, a tiny Flycatcher astonished me by vigorously scolding a Jay near my camp at Lake Outlet. Later I noted a Swainson Hawk on a big bare pine with a Camp Robber perched three feet above him, and each bird totally oblivious of the other.

The flight of a Rocky Mountain Jay seems weak. A few wing strokes carries the bird along slowly and upward slightly, then a sail carries him down at about the same angle, and this sequence is repeated over and over again, resulting in a slow flight of long, shallow undulations. As a rule, long flights are not attempted, but progress is made from tree to tree. In the autumn, this bird often precedes one from place to place especially in the late afternoon; not only along roads and trails, but I have had one fly from tree to tree on the shore while I coasted along in a canoe. I presume this custom enables him eventually to get many a supper scrap.

Most decidedly, Camp Robbers are not songsters; yet I have heard them give several musical calls from a pine top, and their whistled "ker-wheet, wheet, wheet, wheet", with increasing shrillness on each syllable, is very pleasing. In addition they have a variety of calls, mostly wheedling and coaxing, and at times approaching a continuous conversation; often the calls acquire a scolding tone. While some of the whistles are shrill, the majority are in a low tone.

In the Yellowstone, these Jays do not migrate, properly speaking; but

when the fall storms begin many of them move down the mountains to where food is more plentiful. During September and October they become noticeably abundant along the travelled roads and trails, and especially near ranger stations and camp sites recently used. During the exceptionally hard winter of 1919-1920, two or three Jays appeared at Mammoth on November 9 and remained until April 24, during that time going down to the edge of the timber at 6000 feet elevation—the lowest I have any record of seeing this species. But there are many of these birds that remain in the upper parts of the Park, even higher than their known breeding grounds. Cold, itself, is minded very little by them, with such thick, fluffy feathers.

Truly omnivorous eaters, the Rocky Mountain Jays pick up oats dropped about stables or along the roads; catch caterpillars, black worms, and grasshoppers; and once I saw a Jay try for a locust, although he missed and did not try again that I could see. About camps and lunch stops, they vie with the squirrels and chipmunks for scraps of all kinds. Very prompt at locating a camp, they often arrive as soon as I do, or at least come when I am unsaddling my horse. Having once located a camp, they remain in the vicinity as long as the camp does; for it is impossible to scare, or drive, them away. In the mornings they are about before sunrise or even at dawn (at 5 A. M. on several occasions that I know of). If the camp is not awake, they soon make their presence known, greeting the inmates from the trees as they come out. They get into traps baited with cheese and set for rats in all sorts of out-of-the-way places, both outdoors and in. They are adepts at learning regular meal hours and are always on hand for their share; and usually they are ready to welcome one back at night. Often when the owners return they find the Jays in possession of their camp. If the scraps already thrown out become dry or frozen, the Jays come about coaxing for fresh supplies. Camp Robbers like wheat bread, and I have had them steal corn bread from the baking pan. Scraps of meat and fish are favorites. The birds bolt their food as fast as they can pick it up, varied by storing some away in tree crotches, behind bits of semi-detached bark, and in every conceivable nook and cranny. I do not know whether they regularly return to the stores or not, but I do know that many are treasures trove for other birds and for squirrels. One day I had baked beans, and the Jays came even under the tent canvas for them; most of the time a Jay would hastily swallow from one to three beans and then fly off with a mouthful. They really seemed to prefer beans to cold flapjack, although when I saddled up and rode away, they followed, and I imagined they were coaxing for "more flapjack"; for these birds have so many inflexions to their tone of voice that one unconsciously imagines he can tell what they are talking about. Once, during the return from early morning nature-work, a Jay flew from camp a hundred yards to meet me, and then commenced to whistle and chatter as much as to say he wanted breakfast; and then he escorted me back to camp!

Nests are built in tall lodgepole pines during early April at from 7500 to 8000 feet elevation. They are about thirty feet up, or two-thirds of the distance from ground to tree top, and made of straw placed in the angles between the trunk and a limb about two inches in diameter. The inner nest is mostly of pine needles. They are inconspicuous, and in every case the bird has left the nest as soon as I came in sight, without a sound, and hopped up limb by limb to the top of the tree, to perch there with apparent unconcern. On one



occasion, I found young birds being fed on April 11; but my usual luck was to find three eggs, which are grayish, blotched rather heavily with purplish brown about the larger end.

*Yellowstone Park, Wyoming, April 11, 1921.*

## A TWELVEMONTH WITH THE SHOREBIRDS

By ALLAN BROOKS

IT WOULD be difficult in most localities to be able to study shorebirds during every month of the year; and the present notes owe whatever interest they may possess to the fact that changes of location made it possible for me to keep in touch with my favorite group of birds during the whole of the year 1920.

The last days of December, 1919, found me at Comox, on the east coast of Vancouver Island. The fall and early part of the winter had been of exceptional severity; even here on the seacoast there had been over twenty degrees of frost, and I hardly expected to see much in the way of Limicolae. Yet while waiting for Brant on a collection of bars some miles out to sea, large flocks of Black Turnstones, Sanderlings, and Dunlins were constantly in evidence. Among the first named, seeking their food on the stony shores instead of the tidal flats, were several Aleutian Sandpipers, one of which I secured. A large plover which was either a Black-bellied Plover or a Surfbird flew low over the water, but the sun-wash on the water made it impossible to be positive of its identity. I think, however, from its silence that it was a Surfbird. Anyway there were five different species of shorebirds on that island on that cold winter's day; and a few days later, January 2nd, I saw Killdeers and Wilson Snipe on the estuary of the Courtenay River, making seven species wintering at Comox—not bad for latitude 50°!

The first migrating shorebird arrived on April 9, a Greater Yellowlegs; and a few days later I left Comox for Masset, Queen Charlotte Islands, some hundreds of miles farther up the coast. I arrived there April 15 and as the latitude was 54° I did not expect much migration for about a month. Here a surprise awaited me; for the movement of shorebirds was in full swing before the end of April, at its height by May 7, and mostly over by the middle of that month.

The following probably all wintered at Masset, though all were not identified until May 2: Black Oystercatcher, Black Turnstone, Dunlin, Aleutian Sandpiper, and probably Sanderling. The first undoubted migrants were Greater Yellowlegs, on April 22, and Least Sandpiper April 26. Semipalmated Plover and Western Sandpiper came in on the 29th; and the next day brought Black-bellied Plover, Long-billed Dowitcher, and Surfbird, all in flocks and in high plumage.

The Surfbirds were in a flock of one hundred and fifty or more and may have arrived before, or even wintered, as I have a specimen taken here about the middle of April. They were not seen again, but all the other species got

more plentiful up to May 7. This was the height of the rush; there had been heavy rains turning to snow and the ground was white in the morning and the mud flats covered with shorebirds. The new arrivals were Knot, Baird Sandpiper and Marbled Godwit, the latter identified by J. A. Munro, who also doubtfully recorded a small flock of Lesser Yellowlegs. No specimens were taken of either of these last two species then.

The tidal flats of the lagoon at Masset, called Deleatla Inlet, were covered with shorebirds all in full spring plumage. The shore line of Dixon Entrance to the north also showed a good many flocks and where a few rocks cropped out there were Aleutian Sandpipers, Black Turnstones, and Oystercatchers, none of which occurred on the tidal flats.

Wandering Tattler and Spotted Sandpiper both arrived on the 10th. The main rush had distinctly fallen off, but there were still large numbers of waders. Pectoral Sandpiper came on the 12th, never becoming common. Hudsonian Curlew showed up on the 16th; and the next day I took a Western Solitary Sandpiper, a bird I hardly expected to meet so far out from the mainland. It was accompanied by another which rose and performed a flight-song in the air—a wild career, of a series of steep inverted V's. I thought I might have spoilt a chance of finding the nest, as the locality was eminently suitable; but on dissecting my bird later I found that it, also, was a male, which would not have bred for over two weeks. The species was never seen again here. A parallel case was that of Wilson Snipe which was "bleating" in the regular nuptial flight about this time, but left a few days later for more northern breeding grounds.

The last spring migrant to arrive was the Turnstone—not the Ruddy subspecies, but the dark-backed Old World form, a single specimen of which was taken on May 20. This practically brought the spring migration to a close. A few birds lingered on, Sanderlings, Western Sandpipers, Hudsonian Curlews, and Wandering Tattlers, both the latter being seen as late as June 4 when Semipalmated Plovers were sitting on hard-set eggs. These Plovers together with Black Oystercatcher and Spotted Sandpiper were the only shorebirds that remained to breed, although a few pairs of Greater Yellowlegs undoubtedly breed along the east coast of Graham Island.

The notable features of the spring migration of the shorebirds at Masset were its unanimity and early date, especially when compared with a similar latitude on the Atlantic coast or in the interior. The entire migration of birds that were obviously strong adults was over by May 20. After that date only immature and crippled birds were to be seen and not a single one of even these after June 4.

The fall migration at Masset opened with a flock of Western Sandpipers, all adults, wheeling over the flats on the afternoon of July 1. The next day a flock of about eighty-five were busy feeding, having arrived about the middle of the afternoon, and were carefully conned with a binocular at close range. At least sixty-five per cent (and probably more) were females, and not a single young bird in the flock. Very soon they rose and continued their flight southwards.

July 3 found me in a little "gas-boat" anchored four miles out in Dixon Entrance, watching for Shearwaters while the owner fished for halibut. A strong wind due west kicked up a good sea and presently I noticed that there was a big migration of Sandpipers on. Flock after flock passed low over the

waves, driving dead down wind and giving the boat a wide berth. It was more than difficult to get them even for a moment in the field of the binoculars, as one had to hang on to a stay with one hand and use the glasses with the other. Also the birds flew so low that they were only visible as they topped a wave; but as far as one could see there was the flash of their white undersurfaces far out to sea. Western Sandpipers, all adults, constituted the bulk of this huge movement. The only other species thoroughly identified were Sanderlings and Northern Phalaropes, although once I saw what I took to be about three hundred Red-backed Sandpipers or Dunlins.

Here was a great migration of shorebirds travelling with a beam wind down the coast, which, as the wind freshened, had turned down wind through Dixon Entrance to get in the lee of the Queen Charlotte group to pass south through Hecate Strait. We got our anchor up with some difficulty in the middle of the afternoon and as we headed back for Masset we saw the last of the migration. It would be hard to estimate the thousands of shorebirds that had passed and were still passing, for the wind continued for three days; yet along the shore and on the tide flats not a single bird of all this host could be seen.

Two days afterwards six Western Sandpipers were seen on the shore, the only ones seen until the 8th of July when twenty-five Western and two Least Sandpipers arrived, and except an odd bird of these two species the only other migratory waders seen during the month were a few Black Turnstones and Black-bellied Plovers which arrived about the middle of the month. Like the Sandpipers all were summer-plumaged adults.

August brought some movement; two Turnstones (*interpres*) and a Wandering Tattler arrived on the 2nd, together with about 350 Western Sandpipers, among them seven young birds, the first young of any migratory wader to date. Sandpipers and Northern Phalaropes were seen on the 6th, all adults, and the first juvenile Least Sandpiper on the 8th. The next arrivals were Pectoral and Baird Sandpipers on the 10th, a few birds of each, and all juveniles. I have never seen an adult Baird Sandpiper in over 30 years observation of the fall migrations.

On the same date I took the only Golden Plover taken this year, an adult female retaining only a few of the black feathers of the under parts. This is an undoubted Pacific Golden Plover (*Pluvialis dominicus fulvus*); the whole upper surface is broadly margined with bright yellow; cheeks, throat and chest suffused with paler yellow, with an ochre tinge; measurements—wing, 177; tail, 61; tarsus, 43.

The first returning Hudsonian Curlew was seen August 12, a single adult; and the same day brought four Turnstones, *interpres*, adults, and a very large flock of Sanderlings, with not a single young bird in the flock. On the 13th a few Semipalmated Sandpipers arrived, all juveniles (one was taken to ensure identification). I was pretty sure I saw a single bird of this species on the 31st of July, but could not take it without killing a number of Western Sandpipers at the same shot, and so it was allowed to go as I was confident that I would see the species again. During the balance of August this species was frequently seen, usually in company with Sanderlings or Semipalmated Plovers on the outer sea-beach and not on the tide flats. It never became common as it does in the interior of the Province and at Sumas near the coast; so the main migration line of the species must be farther east.

August 22 saw a large influx of shorebirds: Sanderlings (all adults ex-

cept one young which consorted with Semipalmated Plovers), Baird, Least, Western, and Semipalmated Sandpipers (all juveniles), Turnstones (juveniles) and one each of Northern Phalarope, Pacific Golden Plover, and Lesser Yellowlegs, the latter taken to ensure identity, a bird of the year. Two more Lesser Yellowlegs and the first Wilson Snipe were seen on the 28th; and the month closed with the influx of large flocks of juvenile Sanderlings which kept separate from the adults, and the presence of nearly all the species seen during the month in fair numbers, except Golden and Black-bellied Plovers and Lesser Yellowlegs which were not seen again. The resident Spotted Sandpipers and Semipalmated Plovers were in reduced numbers; the adults of both had all or mostly left.

I left the Queen Charlotte Islands on the 4th of September and except for a few Wandering Tattlers and enormous numbers of Northern Phalaropes saw no waders among the islands nearer the coast where I spent the next few weeks. Towards the end of September I arrived at my home on Okanagan Lake in the southern interior of British Columbia. Usually, although the climate is mild, all the shorebirds have left by this time except a few Black-bellied and Killdeer Plovers, Greater Yellowlegs, and Pectoral and Spotted Sandpipers. This season must have been a very remarkable one, however, as on the 25th of September I saw eight species on one small alkaline pond in the foothills—one Black-bellied Plover, five Killdeers, six Pectoral, one Least, one Baird and one Stilt Sandpiper, and one Long-billed Dowitcher. The Stilt Sandpiper was taken, a young bird changing to winter plumage. Surprising as this collection was for so late a date, it was nothing compared to what I saw about a month later in the Province of Alberta.

I arrived at my duck-shooting grounds there on the 9th, and although the nights were cold with quite thick ice on the smaller ponds there were numbers of Black-bellied and Killdeer Plovers and Greater Yellowlegs still remaining. On October 21st, when duck-shooting at Beaver Hills lake, 45 miles east of Edmonton, I was astonished at the number of small shorebirds. There had been very heavy frosts, at least 17°, and all the ponds were frozen, with a good deal of ice along the edges of the lake; yet the following waders were positively identified: Black-bellied Plover (common), Semipalmated Plover (1), Sanderling (3), Baird Sandpiper (3), Pectoral Sandpiper (5), Stilt Sandpiper (1 in full winter plumage taken, a young bird), Dowitcher (Long-billed? 3), Wilson Snipe (common)—eight species in winter conditions in latitude 54°. I saw a Greater Yellowlegs on the 24th flying over an icebound lake. This brought my observations on the fall migration to a close for 1920.

The north end of Graham Island, where most of my work was done, while offering every attraction to shorebirds, is evidently not one of their stopping places, although the large migration seen on July 3 proved that it was directly in the way of their flight-line. The large number of Peale Falcons breeding along the coast here may have something to do with this. Falcons are inveterate hunters of shorebirds, and here they breed in greater numbers than in any part of the world, I should think. At the height of the shorebird migration, the end of July, I spent about a week on Langara Island, at the extreme north end of the Queen Charlotte group. Every rocky point held the aerie of a pair of falcons, and sometimes the yelping of three different broods of young birds could be heard from one stand. The rocky reefs should have been covered with Turnstones and Surfbirds yet not a single one was seen; nor were there

any Sandpipers along the suitable beaches. My companion, Mr. C. deB. Green, heard the note of a Greater Yellowlegs high up in the air; he whistled it down and instantly a Falcon struck at it and missed. Away went the Sandpiper only to return to the alluring whistle. Again the Falcon, a young and inexperienced bird, struck and missed, and then the Yellowlegs left that unhealthy spot for good. Black Oystercatchers, however, seemed to be immune, rearing their young right under the Falcons' nests, unmolested.

Another notable feature of the fall migration is the absence of the Red-backed Sandpiper until about the middle of October, when large flocks of young birds in winter plumage arrive; yet there are numbers of records for September in California, far to the south. It looks as if the adults skipped British Columbia on the southward journey. This dual migration of adults and young is very remarkable and is not peculiar to any particular species. In the case of the Western Sandpiper the flight-line of the adults is evidently more coastwise or even out to sea than that of the young. Considering the enormous number of adults seen on Graham Island, the young were notably scarce; while at Sumas Lake only 60 miles from the coast I have never seen an adult in the fall migration although the young are very abundant.

December found me in Florida where I expected to make the acquaintance of a good many shorebirds that I had not met before. In this I was somewhat disappointed. At Jupiter, on the <sup>east</sup> west coast of the state, the same species were wintering that I knew so well on the Pacific side of the continent—Black-bellied, Killdeer, and Semipalmated Plovers, Least and Spotted Sandpipers and Sanderlings. Except the last, all were represented by one or two individuals only, and these stuck to one locality, being noted almost every day throughout January and February. At Sewall Point, St. Lucie Inlet, there were good feeding grounds and here on February 7, a good number of waders were seen, among them two pairs of Oystercatchers, large flocks of Red-backed and Semipalmated Sandpipers and a few Knots. Pectoral Sandpipers and Lesser Yellowlegs were seen March 3, but the first birds that looked like migrants were a pair of Wilson Plover that arrived at Jupiter on March 24. And shortly afterwards I myself migrated to the North.

Four Least Sandpipers taken at Jupiter on March 5 are interesting in the fact that two are adults and two young birds—all in the gray winter plumage; but while that of the adults is much worn, the young are in fresh feather. On my way home via Texas, California and Oregon I was struck with the abundance of the Hudsonian Curlew at all suitable points; and the wave of these birds that reached Puget Sound a few weeks later showed that here at any rate was a conspicuous shorebird that is more than holding its own.

This ended my twelvemonth or more with the shorebirds, during which time I had the opportunity of meeting with just thirty species of these most interesting birds.

A note on the Surfbird, although not part of my last year's observations, is worth recording here. Mr. C. deB. Green sent me seven of these birds which he took on Porcher Island, off the mouth of the Skeena River, July 12 of this year. Five of these were females and two males; all were in rather patchy summer plumage, a good deal of the former winter plumage showing on the chest. This made me take them for immature and non-breeding birds. But all, and especially the females, show the double incubating patches common to the Limicolae, and had only recently been sitting on eggs. Of course the date is nothing

out of the way, since they have been taken as far south as Chili by the end of June; but still it looks as if the much-sought-after breeding grounds of these mysterious birds lie not so very far north. Black Turnstones which breed south of the Yukon-mouth do not arrive from the north until the middle of July.

I have a theory that many of the females of the Limicolae, especially when they are larger and handsomer than the males, do not remain on the breeding grounds after the young are hatched, but turn them over to the care of the males and start on their southbound journey at once. There is considerable evidence to corroborate this, covering a number of species.

*Okanagan Landing, British Columbia, July 30, 1921.*

## BIRD NOTES FROM SOUTHEASTERN ALASKA

By G. WILLETT

DURING several years spent in southeastern Alaska, principally on the more southern islands of the Alexander Archipelago, the writer has accumulated considerable data on the birds of the region, some of which seems to add to previously published knowledge of their distribution and habits. During the past winter he has also enjoyed the privilege of access to the notes and collection of mounted birds of Mr. Fred H. Gray, of Wrangell. Mr. Gray has resided in that locality continuously since 1899, during which period he has covered a great deal of the surrounding territory and acquired much interesting information on local birds, considerable of which is, through Mr. Gray's courtesy, included herein.

In the following notes the intention of the writer is to include only species regarding which some fact or facts have come to light that add to previously published matter regarding them.

*Stercorarius pomarinus*. Pomarine Jaeger. *Rissa tridactyla pollicaris*. Pacific Kittiwake. These two species are apparently striking examples of birds that use different migration routes fall and spring. The first is common and the last abundant in fall migration, but both are rare in spring.

The Pomarine is the only one of the jaegers that the writer has met with in any numbers along inside channels, the migrations of *parasiticus* and *longicaudus* appearing to be almost entirely made over the open ocean. The earliest fall record for *pomarinus* is of a bird in the dark plumage taken near Howkan, Long Island, August 30, 1919. The latest record is of several birds seen between Shakan and Point Baker, Prince of Wales Island, October 3, same year. The species has been taken at Craig from September 5 (1919) to September 15 (1920), and four birds were seen off Zarembo Island September 25, 1920. The only spring record is of a single bird seen at Craig May 16, 1921.

The Pacific Kittiwake is an abundant fall migrant, being most plentiful during the month of September. The earliest record for the fall migration is August 8, 1919, on which date it was common at Waterfall, Prince of Wales Island. During the fall of 1920 it remained fairly common at Wrangell until October 28 and several birds were seen as late as November 12. Immature birds are occasional during the summer months, but the writer has seen no adults at this season south of Sitka Sound. The only spring record is of a single bird seen at Waterfall April 23, 1916.

*Chlidonias nigra surinamensis*. Black Tern. Nine birds seen (two collected) by Gray near Wrangell September 18, 1903.

**Phalacrocorax auritus cinctatus.** White-crested Cormorant. The writer has been unable to locate any breeding grounds of this bird and believes that it occurs in the southern part of the archipelago only as a winter visitant or migrant. It is rather common at Craig during the winter months, being recorded from September 17 (1920) to April 20 (1920). Apparently rare at Wrangell, a single bird November 4, 1920, being the only one seen during the winter. It was seen daily at Port Santa Cruz, Suemez Island, from February 21 to March 10, 1920. Spring records are of three immatures seen at El Capitan, Prince of Wales Island, May 5, 1921, and two or three adults seen at Forrester Island May 23, 1920.

Gray states that he has seen the species at Cape Ommaney, Baranof Island, in summer, so it is possible that it may nest in that vicinity.

**Lophodytes cucullatus.** Hooded Merganser. According to Gray, occurs occasionally in the vicinity of Wrangell in the fall, being less plentiful in winter and summer. A female (now in Gray coll.) was taken at Olive Cove, Etolin Island, in November, 1917. Two males were taken at Wrangell January 15, 1907, and a female with several half-grown young was taken at the Stikine Mouth September 15, 1903. Two birds were seen by Winfield Wood, of Craig, near Howkan in late May or early June, 1914.

**Mareca penelope.** European Widgeon. Gray took an adult male on the Stikine Flats November 10, 1901.

**Mareca americana.** American Widgeon. The writer examined in the flesh a female and immature male of this species that were shot by Ralph Prescott near Wrangell January 15, 1921. Gray states that it is not rare in winter in favorable localities.

**Glaucionetta clangula americana.** American Golden-eye. **Glaucionetta islandica.** Barrow Golden-eye. Golden-eyes are abundant in the region throughout the winter, beginning to appear early in October and some remaining as late as May 5. Owing to difficulty in differentiating between the two species at a distance, the writer is unable to give as exact data on their comparative abundance as would be desirable. *Islandica* is common all winter, and the great majority of golden-eyes taken from October to January 1 are of this form. Of eighteen birds shot near Wrangell between November 1 and December 31, 1920, seventeen were *islandica*, the other being an adult male *americana*. During early January there appears to be an influx of the latter species and thereafter it is as common as *islandica* and in some localities even more so. *Americana* was abundant at Craig March 17-31, 1920, feeding on herring spawn. The males were courting at this time. They remained in some numbers until May 2.

**Charitonetta albeola.** Buffle-head. An abundant winter resident. First seen at Wrangell October 7 (1920), common two days later, and remaining in some numbers as late as May 9 (1920, Craig).

**Erismatura jamaicensis.** Ruddy Duck. Two seen (male taken) by Gray at Totem Bay, Kupreanof Island, August 15, 1916.

**Chen rossi.** Ross Goose. One shot by Gray from band of thirty, apparently of same species, on Stikine Flats April 15, 1907.

**Philacte canagica.** Emperor Goose. Four seen by Gray at close range near Wrangell, February 16, 1917.

**Olor columbianus.** Whistling Swan. In *Auk*, xxxviii, January, 1921, p. 128, the writer gave several winter records for this bird from Dall and Long islands. In addition to these, Mr. F. H. Gold, of Wrangell, states that from fifty to one hundred swans winter regularly on lakes at Lake Bay, northeastern Prince of Wales Island. Gray corroborates this and states further that the species formerly wintered in small numbers in Wrangell Narrows, near Petersburg.

**Botaurus lentiginosus.** Bittern. Gray has seen and heard this bird occasionally during summer and fall on Stikine Flats, and took a specimen in that locality September 30, 1903. The writer examined a mounted bird in Wrangell that was shot by W. M. Taylor in the same locality October 1, 1919.

**Grus canadensis.** Little Brown Crane. According to Gray, abundant in fall on Stikine Flats from September 20 to October 10; much less plentiful in spring. Two breeding records for the crane are as follows. Two adults and two young, the latter unable to fly, seen by Gray at Totem Bay, Kupreanof Island, in July, 1907. Two eggs taken by Claude Blackington in Big John Bay, Rocky Pass (between Kupreanof and Kuiu islands) in June, 1907. The writer questioned Mr. Blackington in regard to this



latter record and is satisfied as to its authenticity., Mr. Blackington is reliable, is perfectly familiar with the bird, and gave a very accurate account of the nest and eggs. He stated that he took the eggs to eat but found them addled. As no specimens of breeding birds from this region are available, it might be unwise to consider these records as definitely referable to *canadensis*, as a study of the breeding ranges in the last A. O. U. Check-List shows this locality to be almost as close to the northern limit of *mexicana* as it is to the southern limit of the breeding range of *canadensis*.

**Fulica americana.** American Coot. According to Gray, fairly common most falls at Stikine Flats. Two specimens (now in Gray coll.) taken in this locality, one in October, 1902, the other in October, 1906.

**Gallinago delicata.** Wilson Snipe. The writer has previously recorded (loc. cit., p. 128) the occurrence of this species in southeastern Alaska as late as December 7 (1919). In addition to this, a single bird was seen at Wrangell January 15, 1921, and another (possibly the same individual) February 17, following.

**Totanus melanoleucus.** Greater Yellow-legs. Two breeding records by Gray. Nest containing four eggs found at Anita Bay, Etolin Island, July 15, 1913, and four half-grown young with adults seen at Totem Bay, Kupreanof Island, August 15, 1914.

**Aphriza virgata.** Surf-bird. Though well known to be a rather common migrant throughout the region, it was not until the past winter that the writer learned of the Surf-bird wintering in this latitude. About one hundred birds were seen at Shoemaker Bay, four or five miles south of Wrangell, December 4, 1920, and seven specimens taken. Though there was apparently a considerable decrease in numbers shortly after this date, a few remained in company with Black Turnstones (*Arenaria melanocephala*) and Aleutian Sandpipers (*Arquatella maritima couesi*) throughout the winter. They were seen every few days until April 9, shortly after which date the writer left the vicinity and observations were suspended. Specimens were taken on following dates: December 9, January 14, February 21 (two), February 22, March 7, April 9. The latest bird taken showed no indications of acquiring spring plumage.

**Oxyechus vociferus.** Killdeer. A specimen taken by Gray on Stikine Flats May 10, 1907, was sent to the University of Washington.

**Zenaidura macroura marginella.** Western Mourning Dove. Gray has many records for this species, mostly from the Stikine Flats, where on one occasion he saw two young birds that could fly very little. One bird stayed near his house in Wrangell most of the summer of 1902, feeding in gardens. Mr. Parrott, of Wrangell, states that two birds stayed at his ranch, Stikine Flats, for three weeks during September, 1920.

**Haliaeetus leucocephalus alascanus.** Northern Bald Eagle. A peculiar habit of this bird was brought to the attention of the writer by Mr. and Mrs. Winfield Wood, of Craig, who stated that, during the spawning season of the herring, the bald eagles, which are very abundant at that time, occasionally alighted on the water and remained for several minutes. The writer, knowing Mr. and Mrs. Wood to be reliable and accurate observers, watched the eagles closely the spring of 1920 with the result that this fact was verified on several different occasions. Eagles were seen to alight on the water in company with gulls and, after floating for several minutes, seemed to experience no difficulty in again taking wing.

**Falco sparverius sparverius.** American Sparrow Hawk. Two taken by Gray on Stikine Flats May 10, 1907.

**Scotiaptex nebulosa nebulosa.** Great Gray Owl. One taken by Gray on Stikine Flats October 25, 1910.

**Nyctea nyctea.** Snowy Owl. Of two specimens in the Gray collection, one was taken at Olive Cove, Etolin Island, fall of 1901, and the other on Yakobi Island, near Cape Spencer, fall of 1915. Additional records are one shot by Frank Waterbury on Stikine Flats October 30, 1917, and another by W. M. Taylor at Wrangell Narrows in December, 1918.

**Surnia ulula caparoch.** American Hawk Owl. Gray has five records for this bird, as follows. Two taken on Sergieff Island in September, 1904, one taken at Farm Island, Stikine Mouth, October 1, 1905, one taken at Wrangell in September, 1917, and one seen in same locality September 25, 1918.

**Glaucidium gnoma grinnelli.** Coast Pygmy Owl. The writer has previously recorded (loc. cit., p. 128) the occurrence of the pygmy owl on Dall and Wrangell islands.

Since the publication of that note several other specimens from Wrangell Island have been examined and they all seem to be referable to the form *grinnelli* (*californicum* of A. O. U. List). H. S. Swarth writes me that the same conclusion has been reached in regard to a specimen from Wrangell now in the Museum of Vertebrate Zoology. This bird seems to be far more plentiful near Wrangell than in any other part of the region. Two were taken and three others seen during the winter of 1920-21. Gray states that he has about thirty records for the species during his residence there.

**Ceryle alcyon caurina.** Western Belted Kingfisher. Winters in small numbers, though less plentiful at this season than in summer. During the winter of 1920-21, at Wrangell, birds were seen on following dates. December 7, 20 (two), January 4, February 10. Several were seen April 14 and the species was common April 20.

**Colaptes auratus luteus.** Northern Flicker. One shot, but lost in dense brush, at Craig October 21, 1919; one seen at close range at Wrangell October 11, 1920. Gray states that he has twice taken this bird at Wrangell.

**Chordeiles virginianus** (subsp. ?). Nighthawk. On the evening of September 11, 1920, and again the following evening, a nighthawk was seen at Wrangell by the writer's son, G. Willett, Jr. Gray has three sight records for Wrangell, all in September.

**Stellula calliope.** Calliope Hummingbird. According to Gray, quite common at Wrangell in spring and fall during some years; other years apparently absent.

**Nuttallornis borealis.** Olive-sided Flycatcher. One of these birds examined at close range at Craig May 18, 1921.

**Euphagus carolinus.** Rusty Blackbird. Two taken at Wrangell October 10 and one seen November 30, 1920. One seen January 2, 1921, and another January 4, following.

**Loxia curvirostra sitkensis.** Sitka Crossbill. During seven summers and one winter spent by the writer in southeastern Alaska previous to 1920 there was no time when this bird was not in evidence and in most localities it was very common. From observations covering this period it developed that the young were raised in both spring and fall, though whether the same birds nested twice each year was not determined. In late August, 1919, vicinity of Craig, birds were paired and males singing. Fully fledged young were plentiful in late September and early October. Again in late March and early April, 1920, many birds were paired and evidently nesting. A pair of breeding birds was taken April 1 and another pair, also breeding birds, April 2. On April 27 a pair of adults were seen feeding full-grown young on the ground. Since early summer of 1920, though the writer has covered hundreds of miles of territory, not a single crossbill has been met with, and they are apparently absent from the region at present writing. The species is known to be very irregular in its habits, but that it should desert such a large section of territory in which it is normally abundant and should remain absent for such an extended period seems worthy of record.

**Lanius borealis.** Northern Shrike. Occurred at Wrangell in small numbers throughout the winter of 1920-21. First seen October 12; noted every few days from December 5 to March 5; specimen taken December 7 and another March 5.

**Bombycilla cedrorum.** Cedar Waxwing. Gray found a nest containing two young and two addled eggs in an apple tree in Wrangell in June, 1906. Four birds were seen in the same locality in June 1907. The Bohemian Waxwing (*Bombycilla garrula*) is irregularly abundant, generally during winter months, but the above are the only records Gray has for *cedrorum* in more than twenty years observation.

**Myadestes townsendi.** Townsend Solitaire. Gray reports three specimens taken at Wrangell in spring. One of these was given to Ernest P. Walker, now of the U. S. Biological Survey.

*Craig, Alaska, May 24, 1921.*

## THE NORTHWARD RANGE OF THE ALLEN HUMMINGBIRD

By TRACY I. STORER

(Contribution from the Museum of Vertebrate Zoology of the University of California)

THE ALLEN and Rufous Hummingbirds (*Selasphorus alleni* and *S. rufus*) have been the subject of confusion and controversy ever since the former was described in 1877. The difficulty has been due in part to the close similarity between the two birds and in part to the fact that one species (*rufus*) passes northward in its spring migration through the range of the other (*alleni*) while the latter is nesting.

The first source of confusion was the proper geographic application of the specific names *rufus* and *alleni*, but this is no longer a matter of dispute, it having been clearly shown that the name *alleni* belongs to the more southern bird. (See Henshaw, Bull. Nuttall Orn. Club, II, 1877, pp. 53-58; and III, 1878, pp. 11-15; Elliot, *ibid.*, II, 1877, pp. 97-102.) The second and more important difficulty, and one which still exists, has to do with the actual identification of individual birds, either in the field or as specimens in hand.

Many observers, some of whom are careful students, have applied one or the other of the two names (*rufus* and *alleni*) to individual birds seen in the field when as a matter of fact with specimens in hand close scrutiny is required to name them correctly. There are already in print numerous records based upon specimens taken which upon re-examination of the material prove to be in error. How then can sight identifications be made with any expectation of accuracy? The regular ascription of *alleni* as a bird of the Pacific Northwest and of *rufus* as a breeding bird in central California are cases in point. Mistakes of the sort indicated will continue to occur so long as attempts are made to identify these closely related species on any basis save that of carefully collected specimens. Breeding records in critical territory should be based upon brooding birds collected with the nests and eggs. The well known but little appreciated fact that males have no part in the nesting duties makes it necessary to demand that only females be taken as the basis for such breeding records.

The specific differences between these two species are slight yet positive. The principal ones may be summarized as follows:

*Alleni*: Lateral rectrix on each side not more than 2 mm. wide; male with next to innermost rectrix on each side unnotched and back chiefly metallic green.

*Rufus*: Lateral rectrix on each side 3 mm. or more in width; male with next to middle rectrix on each side notched near tip and back chiefly cinnamon-rufous.

Thus the identification of females rests solely upon correct measurement of the outermost tail feather. There is a difference in the distribution of black and rufous on the tail of females appreciable upon comparing representatives of the two, but this does not lend itself to being described in such a way as to prove of value when but a single example is at hand.

My attention was drawn to study this problem by endeavoring to ascertain the basis for the statement in the A. O. U. Check-list (ed. 3, 1910) that *Selasphorus alleni* "breeds from southern British Columbia to northern Lower California." The literature failed to give conclusive evidence, and then correspondence was resorted to, with the net result that I can find but two positive

records for *alleni* north of California, both of which I believe represent casual occurrences.

Henshaw (Bull. Nuttall Orn. Club, III, 1878, p. 14) mentions in particular a green-backed specimen from Washington referable to his *S. alleni*. This was no. 6059 U. S. National Museum which, according to Baird (Rept. Pac. R. R. Surv., IX, 1858, p. 134), was collected April 26, 1856, at Ft. Steilacoom, Washington. Ridgway (Bull. U. S. Nat. Mus., 50, pt. V, 1911, p. 611) makes particular mention of this individual in the synonymy of *Selasphorus alleni*. Dr. C. W. Richmond, Associate Curator of Birds, U. S. National Museum, at my request made a search for this skin in the National collection, but could not find it. Upon turning to the Register of Specimens he discovered that the line devoted to the specimen bears the entry "Destroyed, Aug., 1885." However, the fact that Mr. Henshaw, the original describer of the Allen Hummingbird, and Mr. Ridgway, who has given much attention to hummingbirds, both mention this particular specimen makes the record unusually dependable.

It remains to mention the only specimen of *alleni* known to be extant for the territory north of California. This is an adult male taken by Mr. S. F. Rathbun at Seattle, Washington, May 27, 1894, and at present no. 121 of his collection. Mr. Rathbun kindly forwarded the specimen to me for examination. The outer rectrix on each side is only 1.7 mm. at the widest part, the next to innermost pair of rectrices have no indication of notching and the back is chiefly green.

It is worth while to set forth the results obtained by a critical examination of the literature and by correspondence with the authors concerned in the previous records of *Selasphorus alleni* for the Northwest.

Brooks in 1903 recorded *alleni* as breeding near 158-mile House, Caribou District, British Columbia (Auk, XX, 1903, p. 282); but later, after examining specimens of undoubted *alleni* at Berkeley, recalled his record (Auk, XXX, 1912, p. 253), concluding that he had never seen the species in the Province. Fannin's "Check List of British Columbia Birds" (1891) I have not been able to examine, but Ridgway (*loc. cit.*) summarizes Fannin's statement of the range of *alleni* as "e. Cascade and Rocky Mt. districts." Kermode, in a list published in 1909 (Provincial Museum [Report], 1909, p. 52) uses substantially the same language as Fannin in referring to *alleni*, having evidently followed Fannin. Presumably some of the specimens of *rufus* in the Provincial Museum were earlier referred to *alleni*. A recent letter from Mr. Kermode states that the Museum contains numerous specimens of *rufus*, including some determined by Mr. Oberholser, but no *alleni*. The statements of Fannin and Brooks were evidently the basis for the statements in the A. O. U. Check-list and in Ridgway (1911) that *alleni* was a bird of British Columbia. Mr. P. A. Taverner has informed me by letter that Spreadborough's records of *S. alleni* for British Columbia given by Macoun (Cat. Canadian Birds, 1909, p. 365) are erroneous, being based upon specimens of *rufus*.

The numerous records of *S. alleni* from Washington prove all but two to have been based upon faulty data. Edson (Auk, XXV, 1908, p. 434) recorded the species as a "frequent resident" at Bellingham Bay. Several specimens in his collection, earlier labelled *alleni*, upon re-examination by Mr. Edson and later by myself, prove to be *rufus*. He states in a letter that he has seen *rufus* as early as February, though they do not usually appear until well along in March, and sometimes in April. "Resident" was undoubtedly used earlier

to indicate summer occurrence, not continuance through the winter. Rathbun (Auk, xix, 1902, p. 135) says of *alleni* "rather rare summer resident and undoubtedly breeds." The one bird mentioned above substantiates this record only so far as a single occurrence in summer is concerned. The Ft. Steilacoom record has already been discussed.

Bendire (Life Hist. N. Amer. Birds, II, 1895, p. 217) on the statement of R. H. Lawrence reports that a pair with young, taken near Tacoma, Washington, were exhibited by the Edwards brothers, local taxidermists, in October, 1891. Bowles has twice recorded *alleni* as occurring at Tacoma (Condor, II, 1900, pp. 91-92; Auk, xxIII, 1906, p. 144) but in a recent letter states that he does not know of an authentic record for the state. The mounted group he considers were *rufus*. Lawrence (Auk, ix, 1892, p. 44) gave *alleni* as common at Grays Harbor, but as he distinctly states that he "had a good view of one" on one occasion and does not mention the taking of specimens, the occurrence is not proved. Dawson (Birds of Washington, 1909, p. 400) makes mention of specimens in the Edson and Cantwell collections; the former have already been shown to be *rufus*. Mr. Cantwell writes that he has been on the lookout for *alleni* for years without obtaining it, and that he believes the specimen which he had earlier, and which is mentioned by Dawson, was gotten by exchange from California.

No authentic record for the Allen Hummingbird in Oregon has come to attention. Woodcock (Oregon Agric. Exp. Sta. Bull. 68, 1902, p. 52) on the authority of two of his correspondents lists *alleni* from Dayton and Elkton but no mention is made of specimens. Dr. John Bovard tells me that there are no Oregon taken specimens of *alleni* in the collection of the University of Oregon. At my request Mr. W. D. Strong recently examined the collection of the Oregon Fish and Game Commission in Portland without finding Oregon specimens, and Mr. Stanley G. Jewett states that he has never found the species in Oregon.

In the light of information set forth above it would seem proper to list *Selasphorus alleni* as of but casual occurrence north of the northern boundary of California. Oregon has not been explored so fully as California and it may be that the species invades it locally. The appearance of this Hummingbird in Washington is but casual and its occurrence in British Columbia yet remains to be demonstrated.

*Berkeley, California, June 18, 1921.*

## FROM FIELD AND STUDY

**A Yellow Phase of the Cassin Purple Finch.**—Although Linnets (*Carpodacus mexicanus*) are well known to show variable amounts of yellow, this color has not been detected, so far as I am aware, in other members of the genus. An adult male Cassin Finch (*Carpodacus cassinii*) taken by the writer near Sierra City, Sierra County, California, July 17, 1916, has the normally red areas entirely replaced by lemon yellow. It is now in the collection of Mr. A. B. Howell.—A. J. VAN ROSSEM, *Los Angeles, California, March 25, 1921.*

**Black-and-White Warbler Again in Southern California.**—On April 20, 1921, I observed a male Black-and-White Warbler (*Mniotilta varia*) in full song in a plane tree in a stream bed in Carpinteria, Santa Barbara County. This is, I believe, the sixth known occurrence of the species in California (see Pac. Coast Avifauna, no. 11, p. 144, and Condor, xxii, p. 76). The bird noted above was within a mile of the spot where Dr. Henderson saw the bird noted by him (*loc. cit.*).—RALPH HOFFMANN, *Carpinteria, California, April 23, 1921.*

**Notes on Some Birds of the Berkeley Campus.**—From 1883 to 1889 I was actively engaged in collecting birds at Berkeley, California, and for several years made regular notes on bird migration. Some of these notes appeared in Belding's "Land Birds of the Pacific District", issued by the California Academy of Sciences in 1890, but many of them have never been published. Those on early arrivals or late departures are still interesting in comparison with subsequent observations or in averaging dates of arrival of certain species during a term of years.

Examination of the records in Grinnell's "Second List of the Birds of the Berkeley Campus" (Condor, xvi, 1914, pp. 28-40), indicates that several entries among my notes may be of interest. While my earliest or latest dates have probably now been superseded they may still be worth recording as they refer to years for which there are comparatively few published notes.

*Larus philadelphia.* Bonaparte Gull. A male bird of this species was "found nearly dead" on the University grounds April 21, 1888, and was presented to me by Mr. J. J. Rivers, then curator of the University Museum. The specimen was duly made up and was preserved in my collection in the California Academy of Sciences which was destroyed in the San Francisco fire of 1906.

*Stellula calliope.* Calliope Hummingbird. The statement in Belding's "Land Birds", p. 89, that the Calliope Hummingbird is a "rare accidental visitant" at Berkeley was based on a single specimen collected on the hill, just east of the grove where the Greek Theater now stands, in the early fall of 1884 or 1885. Frank H. Holmes, Hubert F. Burgess and I were collecting together at the time, and the bird was shot by Holmes or Burgess. So far as I am aware it was the only specimen obtained in Berkeley during the years that I collected there.

*Passerina amoena.* Lazuli Bunting. The earliest date of arrival according to my notes is April 18, 1888, which is six days earlier than that mentioned in Grinnell's "List".

*Dendroica auduboni.* Audubon Warbler. My earliest dates of arrival in the autumn seem to be October 8, 1887, and October 2, 1888, and the latest date on which the bird was observed in spring April 15, 1887—all of which have now been superseded.

*Anthus rubescens.* Pipit. The earliest date of arrival that I have for the Pipit in autumn is September 28, 1887, which is several days earlier than the dates given by Grinnell.

*Salpinctes obsoletus obsoletus.* Rock Wren. Not included in Grinnell's list. Although I can not now give any specific dates, I frequently found the Rock Wren, especially in autumn and winter, on the hills east of the Greek Theatre and on the north side of Strawberry Canyon.

*Sitta canadensis.* Red-breasted Nuthatch. My latest spring record is March 27, 1888, while the latest mentioned by Grinnell is March 24, 1913.

*Hylocichla guttata nanus.* Dwarf Hermit Thrush. Early fall records include

October 12, 1885, and October 11 and 13, 1888, but subsequent observers have noted the arrival of the bird as early as October 4, in 1912 and 1913.—T. S. PALMER, *Washington, D. C., May 8, 1921.*

**Extension of Breeding Range of Marsh Sparrow and Monterey Hermit Thrush\*.**—

While carrying on some field work for the California Academy of Sciences in Del Norte County, California, during this past spring (1921), with Chase Littlejohn as assistant, I kept special lookout for marsh sparrows (*Passerculus sandwichensis* subsp.?), as there did not seem to be any good reason for this species limiting its northern range to Humboldt Bay. While it is true that there are but few attractive localities for it along this rockbound coast, at the same time a few small meadows do exist at the mouths of rivers and at the heads of lagoons. One such meadow is at the mouth of the Klamath River, just opposite the little settlement of Requa, Del Norte County, this being an alluvial flat about a mile long and half a mile wide. It is shut off from the ocean by a bar of low sand dunes, and seemed as if it might be a breeding ground for this sparrow, which it proved to be.

A visit to this flat on May 7 resulted in our finding a small number of these birds there, and two males were secured. On May 16 another visit was made to this place and a search carried on for nests, of which none was found. Several birds were seen and another male taken. They were found only at the ocean end of the flat, in land that is more or less of a meadow and has a small stream running through it that is backed up by the tides. Most of the drier parts of the flat are covered with scattered bushes of lupine, and it was perching upon these that the birds were most often seen.

On May 29 another visit was made to this meadow and two or three of the birds were again seen. As we could not find a nest we endeavored to obtain a female, for examination as to breeding status. A pair was finally located, but the female was lost in a thick growth of lupine and grass, most unfortunately. Not wishing to run the chance of exterminating this small colony no further attempt was made to obtain a bird. There can be no doubt, however, as to this species breeding there, to judge from the actions of those seen. A number of dairy cattle daily grazing in this meadow not only kept the grass very short, where unprotected by lupine bushes, but also made the search for nests more difficult by continually getting in our way, or stirring up the birds as they moved about. There was so little grass for concealment in the open that it seems probable that the nests were either in the lupines, or else at the edge of the sand dunes where small drift wood would protect them. As much time as could be spared was devoted to searching for nests, but without result.

Passing through Crescent City, Del Norte County, on a trip into the interior, some good-looking meadow was noted and, upon returning to that town, the morning of May 27 was devoted to settling the question as to the presence there of the marsh sparrow. In a small damp spot just south of the town a pair of this species was located and again a male was taken. The female escaped and disappeared for the moment. A long tramp failed to discover any more, nor did a visit by Littlejohn to another meadow meet with success. This may have been due to the constantly increasing gale that sprang up early that morning and finally drove us indoors for the rest of the day. We arranged to get out at five o'clock next morning for a further search, but a heavy rain set in, with the promise of such bad weather that it was decided to return to Requa, our principal objective, and finish up the work there.

The original idea in looking for marsh sparrows on this field trip was the possibility of finding the Bryant Marsh Sparrow (*Passerculus sandwichensis bryanti*) breeding farther north along the coast than Humboldt Bay. The first bird taken at Requa appeared to prove such a possibility to be a fact, but upon careful study of the other four specimens secured I have concluded to place them all in the category of Dwarf Marsh Sparrow (*Passerculus sandwichensis brooksi* Bishop), not so much on account of measurements as compared with the Bryant Marsh Sparrow, but rather on account of the coloration. As remarked above, the first one obtained is indistinguishable from many specimens of *bryanti* taken in the breeding season in the recognized habitat of the latter form, while the other four of our Del Norte County specimens have the backs

\*Contribution No. 123 from California Academy of Sciences.



appreciably paler in coloration than those of almost any *bryanti* that I have examined and, although the individual measurements of the wings and tarsi are easily within the limits of the latter subspecies, the bills average smaller.

In addition to the above species I would like to record the taking of the Monterey Hermit Thrush (*Hylocichla guttata slevini*) at Myers' Ranch, Humboldt County, California, on June 5, 1921. On this occasion several individuals were seen, one of these, at least, gathering food for its young, and others were heard, in the woods just back of the ranch house. Two specimens were secured for more positive identification, although the song alone, to one familiar with it, is sufficient proof of the presence of this species.—JOSEPH MAILLIARD, *San Francisco, California, June 18, 1921.*

**The "Pasadena" Thrasher Not a Recognizable Race.**—I now believe Dr. Harry C. Oberholser was absolutely right in his contention that *Toxostoma redivivum pasadenense* is synonymous with *T. r. redivivum* (see Auk, xxxv, 1918, p. 52 *et seq.*). The type locality of *redivivum* was Monterey or near vicinity. When I named *pasadenense* (Auk, xv, 1898, p. 236) I assumed that birds from Monterey would be identical with the northern race, whereas, as first established by Dr. Oberholser on the basis of material in the United States National Museum, they prove to be like those from southern California. The Museum of Vertebrate Zoology has recently acquired a considerable number of thrashers representing a series of localities in Monterey County from Seaside southward; and all of these fall with the southern race, thus corroborating Oberholser's findings. Specimens from Santa Cruz, just north of Monterey Bay, are, according to Oberholser, referable to the northern form, *T. r. sonomae*, as are representatives from many localities in the counties bordering on San Francisco Bay. Here is a case where the type locality of a species happens to lie very nearly on the boundary line between the ranges of two constituent subspecies, and the correct allocation of the name first proposed depends upon the exact determination of topotypical specimens. Shifting of the supposed location of the belt of intergradation a few miles to the northward has necessitated transposition of names, and *pasadenense* is no longer to be recognized—save as a synonym of *redivivum*.—J. GRINNELL, *Museum of Vertebrate Zoology, Berkeley, California, June 25, 1921.*

**Cassin Purple Finches Eating Salt.**—While at Chinquapin, Yosemite National Park, on June 8, 1921, I observed four Cassin Purple Finches (*Carpodacus cassinii*) eating rock salt that had been spread upon the ground for the deer. When I commented on this feeding to the ranger stationed there, he said that for some time birds had been coming to the salt patches regularly.—JUNEA W. KELLY, *Alameda, California, June 16, 1921.*

**The Buffle-head Breeding in California.**—The writer has been unable to locate any published record of the Buffle-head (*Charitonetta albeola*) breeding within the State of California. For this reason the following observations are here reported. On June 22, 1921, while engaged in fur-bearing mammal investigations at Eagle Lake, Lassen County, the writer, when looking for muskrats in a tule patch, came suddenly upon a female Buffle-head that was accompanied by two young about one-third grown. The small size, chunky build, plain grayish brown back, long white patch on each side of the head behind and below the level of the eye, together with a small white patch, crossed by a narrow black bar, on the wing, all identified with certainty the old bird as a female Buffle-head. The young were darker than their mother but had a conspicuous white patch on each cheek. Two days later, at the same locality, another female, accompanied by eight half-grown young, was seen. Two other females flew by our boat making a total of four adult females and ten young noted in three days. Every duck seen was closely scrutinized with the binoculars, but not one adult male Buffle-head could we detect. From the above it seems likely that the Buffle-head Duck bred in some numbers this season at Eagle Lake.—JOSEPH DIXON, *Museum of Vertebrate Zoology, Berkeley, California, June 27, 1921.*

**Food of Western House Wrens.**—The microscopic dissections of birds in the field, tabulated by Lee R. Dice and published in the May CONDOR, makes a person who takes most of his 4:30 A. M. observations from a downy couch on the sleeping porch feel that he is using a very lazy method. A strong resolution to profit by the example which Mr. Dice has set, resulted in the following table compiled by the writer from observations made between 10:20 and 11:20 A. M., June 15, 1921. The subjects were a family of eight nestling Western House Wrens (*Troglodytes aedon parkmani*) which were being fed by parents so tame that they could be watched from a distance of six feet. This made it possible to identify with a fair degree of accuracy the items on the bill of fare.

Everything offered was apparently devoured with alacrity except one gray and yellow beetle of considerable size, which one of the parents left inside of the box, but removed after a moment's interval. This is not included in the list.

Table of food eaten by 8 nestling Western House Wrens; Berkeley, California, June 15, 1921; 10:20 to 11:20 A. M.; temperature, 65°; wind, west.

Kind of food	Average per bird	Total number
Lady-bug .....	.625	5
Crane-fly .....	.5	4
Beetles (large) .....	.625	5
Beetles (small) .....	.5	4
Wire-fly .....	.25	2
Lace-wings .....	.125	1
Leaf-hopper .....	.125	1
Cricket .....	.625	5
Grasshopper .....	.125	1
Butterfly .....	.125	1
Moth .....	.125	1
Milliped .....	.125	1
Grub .....	.125	1
Unknown .....	.125	1
Total number of feedings .....		33
Average amount per bird .....		4.125
Average time between feedings .....	1 min. 49.08 sec.	
Average time per bird between feedings .....	14 min. 32.7 sec.	
Number of kinds of food .....		14
Number of feedings per parent per hour .....		16.5
Average time consumed in finding food .....	3 min. 38 sec.	
Number of excreta removed .....		6

—AMELIA S. ALLEN, Berkeley, California, June 30, 1921.

**Vermilion Flycatcher in Western San Bernardino County, in Summer.**—On June 28, 1921, I found a pair of Vermilion Flycatchers (*Pyrocephalus rubinus mexicana*) at the Cushenbury Ranch at the base of the east slope of the San Bernardino Range, in San Bernardino County, California. Although I did not find a nest, I have no doubt that the birds were breeding as they were both busy about a fork high up in a cottonwood and the male was constantly indulging in his flight song.—RALPH HOFFMANN, *Carpinteria, California, July 16, 1921.*

**Gray Gyr Falcon (*Falco rusticolus rusticolus*) in Stevens County, Washington.**—During a recent visit to Colville, Stevens County, Washington, I saw a fine mounted female of this species in the taxidermist shop operated by Mr. L. Loew. The specimen was shot on February 10, 1917, by a farmer living at Echo about ten miles north of Colville. The bird is mounted with spread wings and is in fine winter plumage. Mr. Loew informs me that this is the only record of the species that has come to his attention during the many years he has been in the taxidermist business in Washington.—STANLEY G. JEWETT, *Portland, Oregon, June 11, 1921.*

**Cassin Kingbird in Montana.**—Marcus A. Hanna, while engaged in field investigations in central Montana, in August, 1918, obtained specimens of the Cassin Kingbird

(*Tyrannus vociferans*), a species apparently hitherto undetected in the State. In the course of his work Mr. Hanna camped for a few days in the Bull Mountains, about 16 miles to the southward of Roundup, Musselshell County. The principal forest covering of these hills consists of groves of yellow pine (*Pinus ponderosa*), which cover much of the higher ground and extend northward to the valley of the Musselshell. Among these pines the birds were found in small groups—three individuals on August 5, two on August 6, and four on August 7. They flew from one clump of pines to another, stopping only on the tallest trees, and there only for a short time. Three specimens were collected—two adult males on August 5, and a young bird on August 6. The last was still in juvenal plumage, and manifestly so recently from the nest as to make it practically certain that it was raised in the vicinity. These specimens are now in the Biological Survey collection.—EDWARD A. PREBLE, *Washington, D. C., July 5, 1921.*

**A New Bird for Larimer County, Colorado.**—About May 10, 1921, a Mexican boy captured alive a barn owl (*Aluco pratincola*) near Laporte, five miles west of Fort Collins. This owl is now in a cage in a local garage.—W. L. BURNETT, *State Agricultural College, Fort Collins, Colorado, June 10, 1921.*

**Flocking Habits of the California Valley Quail.**—The following observations were made between December 1, 1919, and May 1, 1920, on a farm which is located near Ripon, California, and about a mile from the Stanislaus River. The farm consists mainly of orchard, the trees being of three varieties, almond, cherries and peaches. A large brush pile was located at one edge of the orchard, about thirty yards from the dwelling house. The first time I noticed the particular flock of Valley Quail (*Lophortyx californicus vallicola*) in question was one morning about ten o'clock when I saw twenty-three birds making their way through the orchard to this brush pile. I found that this action was of regular occurrence with the flock and each morning, some time between the hours of nine and eleven, the flock gradually wended its way towards this protection. My first thought was that in addition to their using it as a place of refuge during the day, the birds roosted in the brush pile at night.

But upon further observation I found that the birds, instead of roosting in the brush pile, merely collected there during the day time for shelter when not searching for food. The "come-right-here" call was often sounded by one member of the flock which was posted some distance above ground for wide observation, though usually hidden in the brush. If a person approached, the bird would utter a call of alarm and disappear into the brush. The brush pile was of considerable size and though I tried to frighten the birds by beating the brush with sticks they merely retreated farther into the middle for protection.

Later observations showed that the birds roosted in some eucalyptus trees about two hundred yards from the brush pile. Each evening at dusk the flock came through the orchard toward the eucalyptus trees usually from a given direction along the bank of an irrigation ditch. As these trees were located in the stable yard the birds usually fed near the barn for some ten or fifteen minutes before flying to their roosting place. It was interesting to note that, usually, only one bird was in flight to the trees at a time, though once stimulated to flight by the leader, the whole flock was lost among the leaves in a remarkably short time. If a part of the flock was disturbed after the flight had begun, the remainder, instead of flying straight to roost, would fly out into the orchard for a time. This was probably a protective measure to lead one off the trail.

At dawn the flock would fly from the trees and proceed into the orchard for food. I wondered if the birds had a definite route of travel, but was unable to follow this out if such were the case. They traversed different parts of the orchard on different days. After foraging in the orchard and adjoining fields they would return to the brush pile for the middle part of the day. The direction from which they came to the brush pile varied on different days. They again returned to the orchard for a feeding trip in the afternoon after which they proceeded to the gum trees to roost.

Their modes of progress while in the field were interesting. At times I was led to think that a certain member of the flock was always followed as leader, while at other times there seemed to be no definite order, the one taking the lead which did not lag behind to feed. The flock, however, usually presented a definite "V" shape, the apex

being in the direction in which the flock was progressing. Certain of the birds were always on the alert more than others and when approached would utter a soft chucking sound which has been described as "whit, whit, whit". I have seen, on a few occasions, birds posted in orchard trees near where the flock was feeding. While they were usually engaged in preening their plumage they were probably sentinels on guard for they were the first to utter the cry of alarm when approached.

Early in April the large flock of birds began to decrease in size and instead of there being twenty-three birds in the flock there were at first two flocks of smaller size and later in the month I failed to find more than seven birds together at any one time. Also, instead of using the same brush pile as a place of refuge, two other brush piles at the opposite side of the orchard were appropriated by a part of the flock.

My observations were brought to a close the first of May and while no nests had been made as yet, it was probable that the flocks further subdivided into pairs or groups of threes for nesting purposes. The assemblage of the birds in large flocks after the nesting season will make an interesting study. Do the birds from each individual nest remain together and constitute a flock till the next breeding season, or do several families unite in the autumn?—JOHN F. KESSEL, *Berkeley, California, June 18, 1921.*

**The Doves of Imperial County, California.**—The intention of the observations recorded in this article was to determine the extent of the breeding season of the doves nesting in Imperial County. Of the three species nesting in this immediate locality (Brawley) two, the Western Mourning Dove (*Zenaidura macroura marginella*) and the Mexican Ground Dove (*Chaemepelia passerina pallescens*) are residents. The third, the Western White-winged Dove (*Melopelia asiatica mearnsi*) is migratory.

A nest of the White-winged Dove was found May 24, 1921, about a mile from my ranch, containing two full-grown young.

The Mourning Dove furnished the following data in 1920:

January 18,	1 nest containing 2 eggs
February 7,	3 nests containing 2 eggs
May 10,	10 nests contained eggs or young
June 22,	16 nests contained eggs or young
July 17,	7 nests contained eggs or young
August 12,	5 nests contained eggs or young
September 23,	1 nest contained eggs or young

The Ground Dove furnished the following data:

January 22,	1 nest containing 2 full grown young
February 14,	same nest containing 2 eggs
April 10,	1 nest containing 2 eggs
May 5,	1 nest containing 2 eggs
June 2,	2 nests containing 2 eggs
August 12,	1 nest containing 2 eggs
September 23,	1 nest containing 2 eggs
November 7,	an old dove seen feeding half-grown young

The Mexican Ground Dove appears to be partial to old nests, using its own or that of a Mourning Dove generally; but I have seen a pair trying a Sonora Red-winged Blackbird's nest; and during 1921 a pair has used an old Abert Towhee's nest for three broods, beginning to sit January 30, on the first eggs, and June 21, on the third set. I have never seen more than five of these doves about at one time. The area covered contains about one acre, the farm residence and 83 trees, mostly eucalyptus and a few pepper-trees.—JOHN C. FORTINER, *Brawley, California, July 1, 1921.*

**A Specimen of the Black Swift from San Diego County, California.**—With one exception, all of the published records of the occurrence of the Black Swift (*Cypseloides niger borealis*) in southern California, which have come to the writer's notice, have been based on "sight" records. The securing of a specimen by J. B. Dixon, 4 miles north of Escondido, San Diego County, California, on June 5, 1921, is therefore of interest. This bird was picked up under a telephone wire. It had met death by flying into the wire as

was revealed by the bruised body when the bird was skinned. The specimen was immediately forwarded to Berkeley where it was made into a study skin and now constitutes no. 41912 in the bird department of the California Museum of Vertebrate Zoology. The sex organs were so decomposed by the time the bird was skinned that it is not possible to state with absolute certainty the sex or breeding condition. The bird had the speckled plumage and square tail which usually characterize the female of this swift. There was nothing to indicate that it had bred recently or was about to breed. In the flesh, the specimen measured: length,  $6\frac{1}{4}$  inches; spread,  $15\frac{1}{4}$  inches. The bird was poor, weighing but 27 grams, whereas fat females average about 47 grams.—JOSEPH DIXON, *Museum of Vertebrate Zoology, Berkeley, California, July 1, 1921.*

**The Bryant Cactus Wren Not a Bird of California.**—I had opportunity recently to examine the Cactus Wrens in the A. W. Anthony collection of birds now owned by the Carnegie Museum in Pittsburgh. The type of *Heleodytes brunneicapillus bryanti* (orig. no. 3879, coll. A. W. Anthony, now no. 17789, Carnegie Mus., San Telmo, Lower Calif., April 30, 1893) is in badly worn and stained breeding plumage; but the race is represented further by a good series and is a perfectly valid one, with characters as given by Anthony (Auk, XI, 1894, p. 212). However, the range of *bryanti* does not reach north in Lower California anywhere nearly as far as the International Boundary; specimens from San Diego County, California, which have been labelled "*bryanti*" prove to exhibit only a slight tendency in that direction, being much nearer *H. b. couesi*. Those individuals showing nearly or quite complete white-barring of the tail do not show the other diagnostic features of *bryanti*, namely very heavy spotting below and dark upper surface. The name *bryanti* must therefore be expunged from the California list of birds, and the name *couesi* used for all the Cactus Wrens occurring within the state.—J. GRINNELL, *Museum of Vertebrate Zoology, Berkeley, California, June 24, 1921.*

**Birds Observed in a Redwood Grove.**—I was pleasantly surprised at the number of birds I heard and saw while spending a few hours in the Mariposa Grove of Big Trees, near Wawona, Mariposa County, California. The first birds to greet me were a pair of Northern Pileated Woodpeckers, fit denizens of such a magnificent forest. They were busily engaged in chipping off large pieces of wood from a dead log, presumably looking for insects, and admitted of close approach.

Next in line came a male Western Tanager, perching on a lichen-covered stump and catching his noon meal of insects. Blue-fronted Jays and Robins were everywhere. Sierra Creepers looked exceptionally small as they were running up the huge tree trunks. From every direction came the songs of the Ruby-crowned Kinglets, Mountain Chickadees and Red-breasted Nuthatches. Occasionally an Audubon Warbler could be seen; and a Modoc Hairy Woodpecker came quite close in his quest for food.

What impressed me was not so much the variety of birds encountered, but rather the number of individuals heard and seen.—JUNEA W. KELLY, *Alameda, California, June 16, 1921.*

**Field Notes from Santa Barbara and Ventura Counties, California.**—*Mareca americana*. A pair seen June 25, 1921, in a tule-bordered lagoon near the mouth of the Santa Clara River, Ventura County.

*Marila valisineria*. A male seen June 25, in the same lagoon, perhaps a wounded bird.

*Sayornis sayus*. Nesting in a barranca just off the Coast Highway three miles west of Ventura. On June 24 the parents were feeding young on insects which they caught on the beach about an eighth of a mile away.

*Molothrus ater obscurus*. Frequent in willows and about a stock-pen near the mouth of the Santa Clara River, Ventura County. One egg found in a nest of the Long-tailed Chat. A few seen repeatedly at the mouth of the Ventura River, and a male observed on July 15 at Carpinteria, Santa Barbara County.

*Ammodramus savannarum binaculatus*. Frequent on June 25 along the dry, gravely flood-plain of the Santa Clara River, Ventura County, near its mouth.—RALPH HOFFMANN, *Carpinteria, California, July 16, 1921.*

## EDITORIAL NOTES AND NEWS

The depressing news comes that Dr. J. A. Allen is dead. He had reached his 83rd birthday on July 19 last, and he died on August 29, 1921. Dr. Allen was editor of *The Auk* (including its predecessor, the *Bulletin of the Nuttall Ornithological Club*) for a continuous period of 36 years, only relinquishing his activities in this connection some ten years ago. In his editorial capacity he exercised an important influence on the trend of American ornithology; his long series of reviews were critical and at the same time fair and stimulative to author and reader alike. Dr. Allen was a thorough scholar; his research, in ornithology and mammalogy, was of the highest grade; he was modest, lacking entirely thirst for publicity; he was not averse to advancement; he was content with the opportunity afforded him of studying concentratedly in his chosen field of science. The American Museum of Natural History, upon whose staff Dr. Allen labored for 36 years, may well be proud of having had associated with it a man of such virtues and of such eminent scientific attainment.

American ornithology is seriously handicapped by the lack of any thorough, down-to-date bibliography or general index. The provinces of geographical distribution and taxonomy are pretty well looked after, it is true; but there remain such very large subjects as avian behavior, voice, feeding habits, and breeding habits. There has been an enormous amount published on these subjects, but how is a student anxious to contribute seriously along any one of these lines to know what has already appeared in print concerning it? The *Zoological Record* helps, but falls far short of meeting the needs in full measure. Perhaps the best available guides to the literature are comprised in the indexes to the *Auk* and the *Condor*. Prospective authors of articles in any field of ornithology should make full use of these indexes, at least, before launching contributions of their own. It is highly desirable in these days of high printing costs that needless duplication be avoided. Also, one's own conclusions are likely to be modified and bettered in the light of the findings and inferences of other students. And then there is the courtesy to be observed in the way of recognizing the offerings of one's predecessors in any line of enquiry.

The "Cooper Prize in Ornithology" has been established at the University of California for the academic year 1921-22. This consists of \$50.00 in cash to be awarded to the writer of the best essay offered on any

topic concerned with birds. Either undergraduate students or graduate students not more than three years out of the University are eligible to compete. Dissertations, either entire or any part or parts thereof, may be submitted. Three judges will award the prize, one chosen by the Northern Division of the Cooper Ornithological Club, one representing the Museum of Vertebrate Zoology, and one representing the University Committee on Prizes. Mr. Charles H. Baker, of Oakland, a member of the Club who desires to stimulate scholarly activity in ornithology, is the founder of this prize.

Mr. F. Kermode, Director of the Provincial Museum, Victoria, British Columbia, in his Report for the year 1920 (page 20), makes the important announcement that the Chinese Starling (*Acridotheres* [or *Aethiopsar*] *cristatellus*) has become well established in the heart of the city of Vancouver, B. C. Nothing is known as to how the colony got started, but at the present time no less than 1200 of the birds roost on ledges on the sides of buildings, faring forth to forage in the fields and gardens of the suburbs. This "starling" is really a species of *Mina*, of whose desirability on economic grounds we have grave doubts. It is frequently brought into North America from the Orient as a cage-bird, though what especial attractiveness it possesses, we fail to see. Control of the introduction of non-native birds as regards both Canada and the United States ought to be more stringent than it is; people should be warned against liberating alien birds, no matter what the species. With the European Starling rapidly spreading in the eastern United States and the Chinese Starling firmly established in the Northwest, the danger that our native bird fauna will suffer through competition and supplantation is increasing rapidly.

Mr. Law advises us that he inadvertently omitted the names of Walter K. Fisher (Northern Division) and Ralph Arnold (Southern Division) from the list of Board of Governors published in *THE CONDOR* for May, 1921, page 101. The name of Fred A. Schneider should not have been included, as he was not a member of the Club for some years subsequent to his presidency.

According to word received from Dr. Chas. W. Richmond, Bent's "Life Histories of North American Gulls and Terns" (*Bulletin* no. 113, U. S. Nat. Mus.) was issued at Washington on August 27. No copies that we know of had, however, reached the Pacific Coast up to September 15.

Mr. John W. Mailliard is at work upon a revised list of the birds of the Lake Tahoe district of east-central California, to be published in an early issue of the CONDOR. Mr. J. R. Pemberton has in preparation an article on the breeding birds of the southern coast district of Texas. Mr. Laurence M. Huey has spent a portion of the summer collecting vertebrates in the White Mountains, Mono County, California, in the interests of Mr. Donald R. Dickey.

### PUBLICATIONS REVIEWED

MATHEWS AND IREDALE'S MANUAL OF AUSTRALIAN BIRDS\*.—This is to be a well-ordered, down-to-date, and complete systematic compendium of the ornithology of Australia, if standards set in volume I prove to be maintained to the end of volume IV as announced. Efforts have been made to condense a great amount of information into small space, with eminent success it seems to the reviewer. The diagnoses of genera and higher groups are based on the latest researches, the synonymies are adequate, and the descriptions of the species are full, including appropriate consideration of the various plumages, nest, eggs, breeding season, incubation period and distribution. A special feature is the reduction of mention of subspecies to within the text of a paragraph with side-head "Distribution and forms". The bold-face headings have to do with full species only. While 188 full species are thus formally treated in the present volume, nearly 700 subspecies are given the brief form of mention indicated.

The Introduction contains short but suggestive essays on "nomenclature", "classification", and "zoogeographical distribution". A thing emphasized in discussing classification is the short-coming of morphologists generally, in each giving overweight to the structural features with which he happens to be dealing. Thus one man has constructed his system of classification on the skeleton, sometimes upon only one portion of the skeleton; another man has emphasized peculiarities of the circulatory system; another, pterylography; etc. Mathews and Iredale are undoubtedly warranted in their

complaint of one-sidedness on the part of most previous taxonomists. Their own efforts have been towards reducing the evidence from all available sources to a fair level, and building the classification here presented accordingly. The authors resent the casual "excursion", as they call the basis of the average contribution to avian morphology, as compared with the long-continued type of study upon which chiefly will the stable classification of the future depend. This is a point the reviewer is prone to complain of, himself: Many current contributions to ornithology are "theses" from persons who have worked in a given field but two or three years, and who rarely ever again publish upon the same subject.

Several of the colored plates show natal and juvenal plumages and serve to bring out a principle made much of by the authors, namely, that young plumages are to be given great weight in indicating phylogeny in birds—more weight relatively than many adult structures such as have been assigned great importance by most previous taxonomists.

Our comments upon the general text will concern some of the matter relating to American ornithology or American ornithologists, and hence most likely to be of interest to the majority of CONDOR readers.

Under "Fleshy-footed" Shearwater (*Hemipuffinus carneipes*), of which it is stated four subspecies have been indicated, it is further remarked that (p. 29) "This species has been procured off the coast of California, and Loomis's measurements suggest that this is a larger race still." In other words there is a possibility that the Flesh-footed Shearwaters visiting the ocean off California come from some breeding ground as yet unknown, but not necessarily south of the equator at all, as once inferred by Loomis from the facts then known to him. Here is a case where careful subspecific discrimination would be of service.

Under Sooty Albatross (*Phoebastria fusca*) the following statement (p. 49) occurs: "Nichols and Murphy contrasted Mathews's measurements with their own; but we would point out that their method of measuring is unknown to us and we cannot reconcile any of their figures with our own data." The reviewer has not verified this; but can it be that any modern writer on technical ornithology has failed to indicate so clearly just how his measurements were taken that his figures are not intelligible to a worker in another part of the world?

\*A Manual of the Birds of Australia by Gregory M. Mathews and Tom Iredale, illustrated with [10] coloured and [36] monochrome plates by Lillian Medland. Volume I [four volumes to complete the work], orders Casuarii to Columbæ. H. F. & G. Witherby, 326 High Holborn, London, [March 9,] 1921. Crown 4to, art canvas, gilt top, pp. xxiv+279, illustrations as above. [Price £3 3s. per volume.]



Under "Light-mantled Sooty Albatross" (*Phoebastria palpebrata*), Mathews and Iredale point out that Nichols and Murphy slipped up (as had Mathews himself) in using the name they did (*antarctica* Mathews) for one of the recognized races, since that name already existed in the synonymy of "typical" *palpebrata*. The former authors therefore here (p. 50) propose a new name, *P. p. murphyi*, for "the South Georgian form." This new name is run in in a text paragraph, and, as with six other new names in the volume under review, it is distinguished in no special way (as by bold-face type) so as to prevent its being easily overlooked. There is, to be sure, a list (p. xxiv) of new names proposed; but this does not suffice. A most reprehensible practise here, as in other works by Mathews and Iredale, is that of omitting any designation of type specimen or of exact type locality.

Under "Royal Albatross" (*Diomedea epomophora*), it is stated (p. 57) that Murphy's "new subgenus", *Rhothonia*, based on the "new species," *Diomedea sanfordi*, "is obviously a form of the present species, agreeing in all details of structure." If this be true, it is a sad case of misunderstood variation. Again, Mathews and Iredale remark "We do not understand Murphy's measurements...".

We note (with alarm!) that the Knot of America becomes (p. 125) "*Calidris canutus rufus* (Wilson)." It seems that the authority for the genus name *Calidris* is "Anonymous"! Its type (by tautonymy) is (p. 123) *Tringa calidris*=*Tringa canutus* Linnaeus. It takes space precedence over *Canutus*. Hence our A. O. U. Committee, who we had hoped settled the case in the Seventeenth Supplement, will have to reconsider it. However, it must be said of Mathews and Iredale, in all fairness, that they have pursued nomenclatural questions with remarkable industry and, seemingly, great care, so as to bring their terminology into exact accord with the rules of the International Code.

As the above paragraphs intimate, Mathews and Iredale are free with criticisms of authors generally. They appear even hypercritical in places, though this impression may be due to the decided lack of criticism which obtains in most other current ornithological literature. When not overdone, the critical attitude is stimulative, and will make for more careful scrutiny of their materials and inferences on the part of future workers.—J. GRINNELL, *California Museum of Vertebrate Zoology, Berkeley, June 19, 1921.*

## MINUTES OF COOPER CLUB MEETINGS NORTHERN DIVISION

JUNE.—The June meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology on the 23rd at 8 P. M. In the absence of the President and the Vice-President, Mr. Joseph Mailliard presided. The following were in attendance: Mesdames Allen, Bamford, Bridges, Burk, Flinn, Griffin, Mead, G. T. Roe, Schlesinger, Thomson, Van Gassbeek; Messrs. Baker, Farber, Grinnell, Hungate, Loomis, Mailliard, Miller, and Wheeler; visitors: Mesdames Howard, Hungate, Mellon, Thomson, and Wheeler, Mr. Martens and Miss Everson.

The minutes of the May meeting were read and approved and May minutes of the Southern Division were read. Mr. Robert Cunningham Miller, 2406 Fulton St., Berkeley, was proposed for membership by J. Grinnell. Mr. Grinnell reported on the steps necessary to the establishment of a University prize for an essay in Ornithology. Further action in the matter was postponed until the next meeting.

Mr. Grinnell then gave a resume of his eastern trip, touching upon his train censuses, his problems for investigation in different museums, his conferences with bird students, and the newest methods of investigation of bird life.

Adjourned.—AMELIA S. ALLEN, *Secretary.*

AUGUST.—The regular meeting of the Northern Division of the Cooper Ornithological Club for July was postponed until August 3, in order that it might be held in connection with the meetings of the Pacific Division, A. A. A. S. The Club convened at 7:30 P. M. for the transaction of business with President Wright in the chair. About 50 members and visitors were present.

The minutes of the June meeting were read and approved. Dr. Grinnell reported on the acceptance of the Cooper Prize in Ornithology by the University of California. Dr. Evermann made an announcement concerning all meetings of the Pacific Division. The following papers were presented as special program for the evening:

Joseph Grinnell, *The Principle of Rapid Peering, in Birds.*

Ralph Hoffmann, *First Impressions of California Bird Life.*

Barton Warren Evermann, *The White Pelican Colonies of Anaho Island, Pyramid Lake, Nevada; Illustrated with lantern slides.*

Adjourned.—TRACY I. STORER, *Secretary pro tem.*

**For Sale, Exchange and Want Column.**—Any Cooper Club member is entitled to one advertising notice in each issue free. Notices of over ten lines will be charged for at the rate of ten cents per line. For this department, address W. LEE CHAMBERS, *Eagle Rock, Los Angeles County, California.*

**FOR SALE OR EXCHANGE.**—Pacific R. R. Reports, 13 vols.,  $\frac{1}{2}$  leather; The Auk, 1916, 1917, 1918, 1919, 1920 (parts 1 and 2 only).—C. A. KOFOID, *East Hall, Univ. of Calif., Berkeley, Calif.*

**WANTED.**—A1 sets of A. O. U. numbers 92, 103, 395, 399, 424, 474f, 478c, 530, 542c, 738a, 741a, 742b, 759d, etc. Want nests where possible. Fine northwestern sets offered in exchange.—J. HOOPER BOWLES, *The Woodstock, Tacoma, Wash.*

**To EXCHANGE.**—"History of the Birds of Kansas", by N. S. Goss, containing life descriptions of 343 species; "Birds of Kansas, with descriptive notes of the nests and eggs of species known to breed in the state", by N. S. Goss. Want "Birds of Missouri", by O. Widmann, other books, or sets of eggs.—LIEUT. L. R. WOLFE, *64th U. S. Infantry, Camp Meade, Md.*

**WANTED.**—Nidologist, vol. I, no. 2, and Osprey, vol. 5, complete except nos. 1, 2, 3; Bulletin 50, U. S. N. M., parts 2, 3, 5, 6, and odd volumes of the O. & O.—HOWARD ROBERTSON, *157 Wilton Drive, Los Angeles, Calif.*

**NATURAL HISTORY COLLECTOR** in northern Australia desires advance orders for vertebrate specimens. I start work in October, but letters will be forwarded. Address: T. VAUGHAN-SHERREIN, *c/o Mr. Dixon, "Gunnersbury", Rickard Street, Auburn, Sydney, N. S. W.*

**WANTED.**—Nuttall Bulletin, vol. I, complete; The Auk, vol. VI, no. 1 (Jan., 1889).—TRACY I. STORER, *Museum of Vertebrate Zoology, Berkeley, Calif.*

**BOOKS WANTED.**—Proceedings of the Biological Society of Washington, vols. 3, 4, 5, 6, 18, 20; "Birds of Alaska", by Dall and Bannister; Bulletin of the Cooper Ornithological Club, vol. I, complete or odd numbers.—W. LEE CHAMBERS, *Eagle Rock, Los Angeles, Calif.*

**STILL LACKING.**—Through exchange notice on this page, I have completed my set of the Auk. I still lack Bulletin Nuttall Ornithological Club, vol. 1, no. 2; vol. 2, no. 3. I will pay any reasonable price for a copy of either or both of these numbers.—R. C. MCGREGOR, *Bureau of Science, Manila, P. I.*

**WILL EXCHANGE** any or all of my natural history collections for a good well-rated automobile. I have: 840 North American and foreign birds, skins and mounted; over 400 sets birds' eggs, catalogued at about \$2600 at Taylor's list prices; 7000 specimens, 2000 species, fresh-water and marine shells; about 275 minerals; about 300 fossils; 2000 Indian relics; a  $5\frac{1}{2}$ -foot mounted alligator. Any one interested notify me as to year, make, condition and equipment of auto offered and ask for detailed list of collections. Or take a run up in the machine, look over the collections, and talk trade. Write first.—H. F. DUPREY, *R. D. 1, Box 78B, Dixon, Calif.*

**FOR SALE.**—My ornithological library containing complete set of Nuttall Bulletin and Auk, Bird-Lore, Nidologist; Cory's "Birds of Haiti and San Domingo"; Ridgway's "Birds N. and Mid. Amer."; first edition of Nuttall's "Ornithology"; Coues' Bibliography, complete; etc. Large stock of pamphlets. Parties interested will kindly let me have lists of their wants.—RALPH W. JACKSON, *Route No. 1, Cambridge, Maryland.*

## MEETINGS OF THE COOPER ORNITHOLOGICAL CLUB

**Northern Division:** 8 P. M., *fourth Thursday* of month, at Museum of Vertebrate Zoology, University of California, Berkeley. Take any train or car to University Campus. The Museum is the corrugated iron building on south side of campus just north of football bleachers.—MRS. AMELIA S. ALLEN, *Sec'y, 37 Mosswood Road, Berkeley, Calif.*

**Southern Division:** 8 P. M., *last Thursday* of month, at Museum of History, Science, and Art, Exposition Park, Los Angeles. Take car marked "University", west-bound on 5th Street (in down-town district); get off at 39th Street and Vermont Avenue. One long block east to Park. The Museum is the building with the large dome.—L. E. WYMAN, *Sec'y, care of Museum.*

**Intermountain Chapter:** Get date and place from the Sec'y, ASHBY D. BOYLE, *351 5th Ave., Salt Lake City, Utah.*

**San Bernardino Chapter:** Get date and place from the Sec'y, M. FRENCH GILMAN, *Banning, Calif.*



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# THE CONDOR

A Magazine of Western  
Ornithology



Volume XXIII November-December, 1921 Number 6



W.K.F.

COOPER ORNITHOLOGICAL CLUB

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A Magazine of Western Ornithology  
Published Bi-Monthly by the Cooper Ornithological Club

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Entered as second-class matter November 29, 1919, at the post-office at Berkeley, California, under Act of Congress of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized January 5, 1921.  
Issued from the Office of THE CONDOR, Museum of Vertebrate Zoology, Berkeley, California

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## SUBSCRIPTION RATES

Two Dollars per Year in the United States, payable in advance.

Forty Cents the single copy.

Two Dollars and Twenty-five Cents per Year in all other countries in the International Postal Union.

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## COOPER CLUB DUES

Two Dollars per year for members residing in the United States.

Two Dollars and Twenty-five Cents in all other countries.

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Manuscripts for publication should be sent to the Editor, J. GRINNELL, Museum of Vertebrate Zoology, University of California, Berkeley, California.

Claims for missing or imperfect numbers should be made of the Business Manager, as addressed below, within thirty days of date of issue.

Cooper Club Dues, Subscriptions to The Condor, and Exchanges, should be sent to the Business Manager.

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W. LEE CHAMBERS, Business Manager, Eagle Rock, Los Angeles County, California.

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Issued November 19, 1921

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# THE CONDOR

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Volume XXIII

November-December, 1921

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[Issued November 19, 1921]

## HOME LIFE OF THE BLACK-TAILED GNATCATCHER

By ROBERT S. WOODS

WITH SEVEN PHOTOS ON FOUR BLOCKS

ONE of the most restricted in distribution of all the birds in the United States is the Black-tailed Gnatcatcher (*Polioptila californica*), which is found in certain arid, brushy sections of the Pacific slope of southern and Lower California. The observations set down herewith were all made on the San Gabriel Wash at Azusa, in Los Angeles County.

The habits of this species differ somewhat from those of the Western Gnatcatcher, and the name "gnatcatcher" does not appear to be so appropriate to it. Baird, Brewer and Ridgway (North American Birds, 1874) state that "at times it will dart about in the air in pursuit of small insects"; but after watching these birds many times at all seasons of the year the writer has found this to be a decidedly rare occurrence, although they sometimes do hover momentarily to pick something off a branch; and an occasional snap of the bill at other times suggests flycatching activities even if one does not actually see the birds. In the locality mentioned, at least, the food is practically all obtained by search through the branches of shrubs. The birds do not seem to care for water, either for drinking or bathing.

The Black-tailed Gnatcatchers do not wander much during the course of a year, and ordinarily it is possible to locate a pair at almost any time within an area of a few acres. They also confine themselves rather strictly to the brush, only casually visiting adjacent orchards or gardens. The call-note varies considerably, but may be distinguished from that of the Western Gnatcatcher by a certain querulous tone and it is very thin and plaintive in character.

The nest is deeply cup-shaped, sometimes slightly constricted at the top, and is compactly and neatly constructed of small pieces of grass, bark, fiber, paper, cloth, string, etc., and lined with small feathers, rabbit fur and soft cottony material. The interior measurements of three nests were  $1\frac{1}{2}$  inches in diameter, by  $1\frac{1}{4}$  inches in depth.

The nest shown in figure 29a, into whose construction small bits of newspaper had entered largely, was found on June 25, 1920, just as the young were ready to leave. The four young birds were arranged in two layers, and of one of those in the lower layer only the beak was visible; yet on leaving the nest all seemed equally vigorous and well developed. One of the bottom ones, how-

ever, remained in the nest an hour or two longer than the others (fig. 29b). The four were seen together in the neighborhood for some time.

About March 1, 1921, a pair of gnatcatchers (possibly from the brood just mentioned, which had passed the winter in the vicinity) started a nest near the top of a low sumac bush (*Rhus laurina*) about  $2\frac{1}{2}$  feet from the ground. The work proceeded rapidly at first, most of it being done by the male, and then gradually slowed up. By the middle of the month the nest, which was ready for the lining, seemed to be deserted, and a week later was found overturned and partially destroyed. This suggested a search for a new nest, which was found a day or two later about 125 feet away in a clump of cactus and weeds and about two feet from the ground. It was complete except for part of the lining, which was added to from time to time until finished, after which the birds showed no further interest in it.

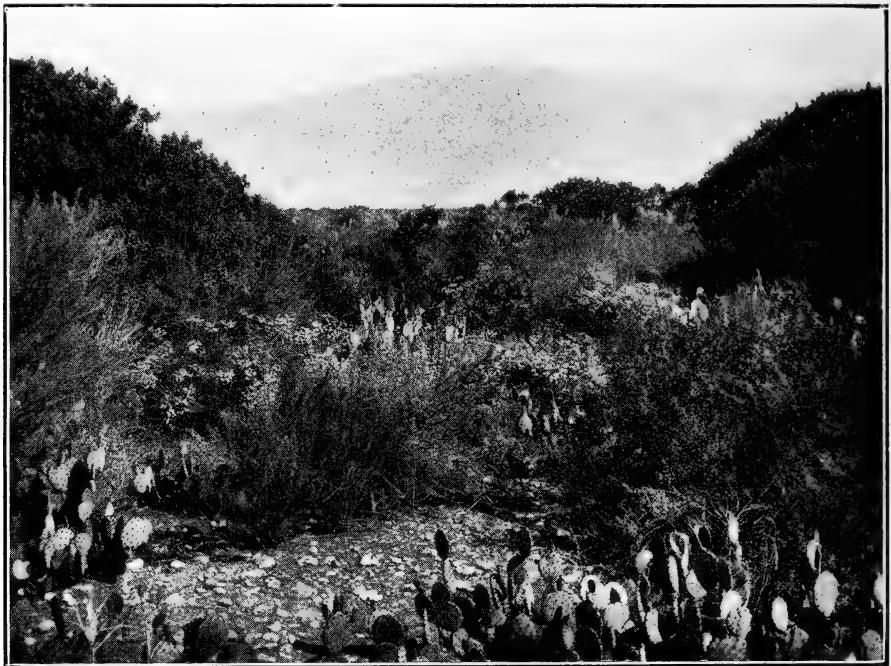


Fig. 28. HABITAT OF THE BLACK-TAILED GNATCATCHER, SAN GABRIEL WASH., NEAR AZUSA, CALIFORNIA; PHOTOGRAPHED JUNE 30, 1921; A NEST WAS SITUATED IN THE CENTER OF THE LOW BUSH IN THE RIGHT FOREGROUND.

On April 22, by following the male gnatcatcher for a while, I located a third nest in a buckthorn bush (*Rhamnus crocea*) about 250 feet from the last. The site was much the best of the three, being about  $2\frac{1}{2}$  feet from the ground and in the midst of such a thick mass of twigs that the nest could not be clearly seen from any direction (fig. 30a). There were three eggs, grayish or bluish white speckled with reddish brown. The duty of incubation was divided between the two parents and the eggs were seldom left uncovered even for a moment. The birds showed no resentment at the presence of a human spectator, though the approach of another bird within perhaps fifty feet of the nest was often the cause of fierce demonstrations on the part of the male gnat-



catcher, and they would scold vigorously at the appearance of a cat even outside of the nesting season.

The young were hatched out on May 3 and left the nest nine days later, on May 12. They remained in the same clump of bushes until the next day, when in response to urging by the parents they made several moves to other bushes. It would seem to require a well developed memory for location to enable the old birds, on returning from a distance with food, to find the young ones; for they sit quietly in the interior of a bush surrounded by many other similar bushes. On two such occasions I saw the mother bring food to a bush which the young had left some time previously. After searching for a while and then calling without answer from the young ones she appeared to recollect and flew at once to them.

The food furnished consisted of a large variety of small insects and spiders. The larger insects were first thoroughly beaten against a branch. The



Fig. 29. *a*, FOUR YOUNG BLACK-TAILED GNATCATCHERS. *b*, SAME NEST LATER, WHEN ONLY ONE YOUNG REMAINED. NEST ILLUMINATED BY SMALL MIRROR; BOTH PHOTOGRAPHS TAKEN JUNE 25, 1920.

largest insect noted was a walking-stick which, being nearly as long as the young bird, required considerable swallowing. One of the brood disappeared a few days after leaving the nest, but by the first of June the other two were beginning to hunt their own food and could be distinguished from the mother only by the greater amount of white on their outer tail feathers.

On June 8 an inspection of the nest showed that a section of it had been removed, and it was found that only a small portion of the unused nest previously built remained. A short search in the vicinity of the latter revealed a nest containing three eggs, about 50 feet away. The situation (see fig. 28) was similar to that of the nest used before, except that the foliage was less dense, and was also very similar to that of the nest found the previous year. The nest (fig. 30b) appeared a little looser and bulkier than those built of new materials. As previously, the male seemed anxious to do his full share of the incubating and would sometimes almost force his mate from the nest. While

on the nest he maintained a vigilant watch, frequently peering over the edge and closely scrutinizing the ground beneath. The female evidently occupied the nest at night, as well as part of the day. The two young gnatcatchers were not allowed to loiter near the nest.

On June 21 newly hatched young were found. The exact time during which they occupied the nest was not determined, but it was at least a day or two longer than in the previous case. This was not due to their remaining until a later stage of growth, but to an actual slower development. The nest



Fig. 30. *a*, MALE BLACK-TAILED GNATCATCHER NEAR NEST, THE LATTER BEING SITUATED IN DENSE GROWTH AT LOWER LEFT; PHOTO TAKEN MAY 10, 1921.  
*b*, FEMALE GNATCATCHER ON ANOTHER NEST; PHOTOGRAPHED JUNE 10, 1921.

being only partially shaded, the male was accustomed to stand in it a large part of the time during the heat of the day in order to protect the young from the sun (fig. 31a). The nest and its surroundings were left in a perfectly clean condition. The young remained with the parents until early in August, after which the original pair continued to occupy the same territory, while the young drifted off together to other hunting grounds.

A certain degree of individuality was noticeable among the various gnat-

catchers. In the case of the pair nesting in 1920 the male invariably followed the female from bush to bush while hunting together. This female was notable for the decidedly brown tone of the back and wings, contrasting with the clear gray of the male. The male whose photographs appear herewith showed at all times an independent and fearless disposition. His mate, after each brood was hatched, at first refused to visit the nest while a person was near, but soon gained confidence. Under other circumstances she occasionally indicated marked curiosity by approaching silently to within arm's length or hovering close above one's head.

It does not seem to be generally known that the black cap of the male Black-tailed Gnatcatcher is present only in spring and summer plumage. Hav-



*a* *b*  
Fig. 31. *a*, MALE BLACK-TAILED GNATCATCHER SHADING YOUNG FROM SUN;  
ILLUMINATED BY REFLECTED LIGHT; PHOTO TAKEN JUNE 30, 1921. *b*,  
MALE BLACK-TAILED GNATCATCHER; PHOTOGRAPHED MAY 13, 1921.

ing previously noticed the absence of black-capped birds during the fall and winter months, I was able, by systematically watching the male here shown, to observe the changes in the color of the cap. About the middle of February black patches appeared on the crown and quickly spread over the entire top of the head. The reverse change in the fall took place much more slowly and in the form of a gradual obscuring and replacing of the glossy black by gray. The first signs of gray could be detected about the middle of July and it required approximately a month and a half for all traces of darker color, with the exception of a permanent blackish streak above the eye, to disappear. The change appeared to be complete before the new tail feathers were entirely

grown out. It might also be mentioned that the white edgings of the tail, which in fall and winter are conspicuous and readily apparent in flight, become much restricted or entirely wanting in summer plumage.

Owing to the nature of their feeding grounds not much can be said as to the economic value of Black-tailed Gnatcatchers, but they consume large numbers of moths, which doubtless include some injurious species.

*Los Angeles, California, September 10, 1921.*

## NOTES ON FALL MIGRATIONS OF FOX SPARROWS IN CALIFORNIA

By JOSEPH MAILLIARD\*

WITH the idea of learning more about the fall movements of some of our fox sparrows, and particularly those of the Yolla Bolly Fox Sparrow (*Passerella iliaca brevicauda*), in the autumn of 1919, in company with Mr. Luther Little as assistant, I made a trip to a place on Eel River, near the southwestern base of Mt. Sanhedrin, on the summit of which the latter species is known to breed. The week of September 15 to 20 was passed here, but we found that there was no good fox sparrow country within workable distance of our headquarters. That some were passing through the locality was proved, however, by the sight of two individuals on the morning of September 20, neither of which was secured for identification; but these were evidently of the smaller billed, dark group from the northwest coast, southern Alaska to British Columbia, designated by Swarth as the "Unalaschcensis group" (Univ. Calif. Publ. Zool., vol. 21, 1920, p. 89).

My brother, John W. Mailliard, arrived on the afternoon of September 20, and placed his services and car at our disposal for the ensuing week. On account of the lack of good country for observation here it was decided to run up to Lierly's, a well-known hunting resort at a more appreciable elevation and nearer to the summit of Mt. Sanhedrin. During the next day the party identified 37 species of birds, but the only fox sparrow seen was again one of the above group. On September 22, my brother and Little went up to the top of Sanhedrin to ascertain if the Yolla Bolly Fox Sparrows were still there. Several of these were obtained. Having proved this point, we moved next day to Glenbrook, Lake County, just north of Cobb Mountain, at an elevation of 2300 feet. Near this spot is a large tract of brushy territory containing a considerable mixture of ceanothus and manzanita brush, upon the seeds of which the fox sparrows largely subsist.

On the morning of the 24th we went up a few hundred feet higher into this brush country, and immediately commenced to get results. Fox sparrows were not so very numerous but would occasionally appear or could be "squeaked up" from time to time. While none of this genus had been found here during our visit from April 28 to May 3, of the previous spring, the local-

\*Contribution No. 127 from the California Academy of Sciences.

ity seemed to be a good place in which to intercept migration. The weather was rather warm at this time and, toward noon, as the sun's rays became more intense, the sparrows kept so close to cover that our work had to be postponed until early the next morning.

I had figured on finding some of the Yolla Bolly Fox Sparrows in this place, working down from the higher altitudes of the Sanhedrin range to the north, and was pleased to find the expectation correct. In fact, 60 percent of our take here was of this species, showing that it leaves its breeding ground at about the same time as the earliest northern migrants commence to arrive or, as one might say, drift in.

We passed but two days at Glenbrook and then went back to our former collecting ground at Castle Hot Springs, at an elevation of 2800 feet on the Mt. St. Helena Range, Lake County, just south of Cobb Mountain. Here there is some very good brush country for fox sparrows, at about 3000 feet and upward.

The morning of September 26 was a very warm one. My brother and I went in one direction and Little in another. We went through some forest along an old mining trail into some good-looking brush, securing a few specimens, but soon the heat became so intense that we returned to a woody canyon that ran up through the brush, and camped down near some small pools of water. It was not long before a fox sparrow appeared, and another and another! Soon we discovered that there was a regular stream of them coming to the water holes. We could see only for a few yards on any side and could not well make out whether the birds were approaching from any special direction, but most of them appeared to be coming up the narrow bed of the dry arroyo toward the tiny spring that still contained water, and to a few small holes in the rocky bottom that had a little water left over from an unusual summer rain. The season had been a dry one and water was scarce in the vicinity.

We obtained a number of specimens, of several different subspecies, never knowing what the next one would prove to be, and later found that Little had been equally successful on the brushy hillside where he had been working, which was along the road leading to the springs. A large number of fox sparrows were moving in the brush there, and many flew across the road. Little's notes relate that "the fox sparrows were very abundant and, as they flew about making a thrush-like noise, or better yet, the junco note, I thought the country must be overrun with thrushes or juncos." None of us had ever before in our lives seen such a number of these birds at any one time.

This movement recalled to my mind a late September day, many years ago, when I was staying with Mr. William Kent, at Kentfield, Marin County, California, when we were deer hunting on a spur of Mt. Tamalpais. At one time during that morning, as I was sitting on a rock overlooking a steep, brushy canyon, I noticed a most curious rustling on all sides below me, which I could not at first account for. After watching for a while, I caught sight of a fox sparrow scratching under a thick bush near by, and it gradually dawned on me that this subdued, but vast—if such an expression be allowed in this case—rustling was being produced by a great number of individuals of this bird group scratching for the seeds among the dead leaves of manzanita and ceanothus bushes. As but few of the birds came to the surface of this sea of

brush it was difficult to see them or to get an idea of what subspecies they belonged to, and, most unfortunately, we had nothing smaller than rifles with which to collect any for identification. This was certainly a regular "wave" of migration; and in all my years of hunting and collecting at the old Rancho San Geronimo, only about five miles north of this spur of the mountain, with equally brushy areas and at about the same elevation, I had never encountered one like it.

But to return to Castle Springs: About the middle of the morning we had enough specimens to keep us busy for the rest of the day, so we returned to headquarters and went to work saving them, which took us until six o'clock in the evening. About that time a breeze came up and it commenced to cool off quite rapidly. The breeze soon developed into a howling gale and sleep was impossible that night in the tent-house we were occupying.

A dense fog drove in with the gale and by morning everything was dripping, with the prospects anything but alluring for favorable observation. My brother had to return to his own home that day and the outlook for better weather was so poor that I decided to take advantage of his transportation facilities and drop down to Harbin Springs to see what was going on at a lower elevation, where the weather was apt to be more favorable for us. But the next day it commenced to rain and the bushes were too wet to work in. As soon as the weather permitted, we resumed our observation of fox sparrows in the surrounding brush, which was fairly well adapted to their needs. It seemed as if the rain should have made ideal scratching ground for these birds but, while we found a few there, they were not numerous, and even these became scarcer as the days went by. Soon they became so scarce that we concluded the "run" must be over and that it would not pay us to remain longer.

Of the different individuals taken were many that were very difficult to place satisfactorily. At Glenbrook, September 23 and 24, the Yolla Bolly Fox Sparrow was the most numerous, comprising 60 per cent of the number secured, but at Castle Hot Springs, of those taken during the migratory wave of September 26, 1919, the percentage of this subspecies was 30. This sparrow was usually easily recognized, even in the brush, where not too dark to see it well, as its grayish back and light colored breast were quite conspicuous among the more reddish or brownish races. Evidently this race begins to forsake its breeding ground long before harsh weather conditions compel it to do so, as the comparatively low elevations at which it breeds in California—5000 to 6000 feet—are not particularly cold nor subject to severe snow storms as early in the fall as the date at which we found it common.

The greater number of the *Unalaschensis* group, that is of the darker, more reddish, and more slender-billed races, which we secured are referable to the forms Valdez, Yakutat and Sooty Fox Sparrows (*Passerella iliaca sinuosa*, *annectens* and *fuliginosa*, respectively), with a good deal of intergradation between, and the first two predominating in numbers; yet there were a good many individuals that we could not place. There were also one or two other races represented by a stray bird here and there.

In order to ascertain if the wave of migration was an annual occurrence I went again to Castle Hot Springs in 1920, taking with me Mr. Chase Littlejohn as assistant. So as to be on the ground in plenty of time to observe the migration, should it occur, September 19 was the date selected for the com-



mencement of our vigil, as being a week earlier than the date of the big wave of 1919.

That morning found us in readiness for any sized wave that might come along, but none came that day nor for a good many days thereafter. We found a few fox sparrows scattered through the brush, and tried by various means to watch them, as well as to secure specimens for identification, finally coming to the conclusion that the best method was to camp down near some of the far from numerous water holes and wait to see what might come to drink. We cleared the trash from under the thick brush so that we could see a few yards around about and kept still for hours at a time.

Of those which we saw under these conditions, some certainly came there to bathe and drink, but a good many appeared only to be passing along, often chirping the characteristic fox sparrow note, so much like a similar note of the juncos. Evidently the Yolla Bolly Fox Sparrow, which was almost the only form we saw for the first few days of our stay, was dropping down, just as at Glenbrook, from its comparatively near breeding grounds which extend from Mt. Sanhedrin, Snow Mountain, etc., up into the Yolla Bolly and Trinity ranges. Probably the birds we first saw were from Sanhedrin and the adjacent mountains not much over 60 miles away, while the later ones came from the more northerly ranges.

The only way to find out what subspecies were passing thorough was to secure some specimens each day. Some days we would obtain only one or two apiece, while on others we would do a little better, but toward the end of the month there was a very decided increase in the numbers noted although nothing that could be described as a "wave" had materialized. It appeared as if the migration this year was just a sort of drifting process and it did not seem worth while for both of us to stay to watch this, so I decided to return to San Francisco, but to leave Littlejohn for a few days longer just in case something might happen. We had been breakfasting on cold bread and milk at daylight so as to reach the observation grounds as soon as it was light enough to see clearly. On the morning of September 30 I was all packed up to leave and was breakfasting at the civilized time of 7:30 when Littlejohn, who had gone out at our usual early hour, came in breathless to say that when he reached the grounds "the hillsides were alive with fox sparrows".

According to his description they were coming in bunches from the north, numbers settling in the brush or along the road for a few moments to scratch, while others appeared and passed beyond, the different bunches thus constantly overlapping as so often do blackbirds when feeding in flocks, those in the rear continually rising and flying ahead of the advance guard.

Hurrying back in all haste to my quarters, unpacking and getting the necessary paraphernalia together, I made the best speed of which I was capable up the grade to the spot, but arrived just in time to be too late. Not a sparrow was in sight. The rest of the morning was passed in the hope of a second wave appearing but nothing of the kind happened. We secured a few scattering specimens, but that was all.

Still in the hope of a repetition of the occurrence we remained here until October 5, and I was partially rewarded by the advent of at least a small wave which, insignificant as it was in size, gave me an opportunity to see what the actions of the individuals composing it were like.



This migratory wavelet was noted on the morning of October 4, just before sunrise. As I reached the extremity of the brush-land where, around a sharp spur, the woods commenced again on the north side, I ran into this small band of new arrivals, perhaps a dozen or so. As expressed in my notes taken at the time these birds "came out of the brush like flying fish out of a wave" and dove in again a little farther on, but whether they came up out of the woods on the north, or had flown clear across the deep canyon over the tops of the trees from Mt. Cobb, I had no way of judging as I was a few seconds too late to see just in what manner they had landed on this spur. After a while we went down to the places which we had cleared around the water holes and soon noted birds that appeared to be new arrivals, as they were very thirsty.

It would seem from these observations that the fox sparrows travel extensively in the night and early morning. The wave of 1919 was much larger than anything we saw in 1920, and the birds seen in that case had evidently camped down for the day, the intense heat of which induced them to seek water, thus creating the activity which we observed.

As before remarked, almost all the birds first taken at Castle Hot Springs were the Yolla Bolly Fox Sparrow; but by September 28 the ratio commenced to change and toward the last of our stay the proportion was very small, the average being about 38 per cent for the whole period of observation.

Of the other subspecies taken, practically all belonged to the Unalaschcensis group, but they seemed to run rather darker than those of the previous year. Many of these I have placed with the Yakutat and Sooty forms (*P. i. annectens* and *fuliginosa*); but few, however, are typical, and there are many individuals which neither Mr. H. S. Swarth—who is our best authority on fox sparrows today—nor I can satisfactorily place, this being true of many of those taken in the fall of 1919 as well.

These undetermined individuals appear to belong somewhere between the Valdez and Sooty Fox Sparrows as before remarked, although none approached the more reddish race, *townsendi*; but as a whole they are so nearly homogeneous that it seems as if there might be some locality to the north of us, unexplored as far as fox sparrows are concerned, which may prove to be the breeding ground of a more or less distinct race, and from which these at present undetermined birds come. Meanwhile these particular specimens lie in our cases with the label marked "subsp.?" There is a good deal yet to be learned about our speckle-breasted friends, the fox sparrows.

*San Francisco, September 8, 1921.*

## THE MIND OF THE FLOCK

By R. C. MILLER

THE BEHAVIOR of individuals in a group affords one of the most puzzling problems of psychology. Throughout the animal kingdom we find among gregarious forms a unity of purpose and a tendency to concerted action which does not readily yield itself to explanation. The synchronous flashing of fire-flies; the manner in which the gregarious larvae of certain saw-flies curl their tails upward by a common impulse when approached; the well-ordered flight of wild geese, or the intricate gyrations of a flock of Golden Plover, a hundred birds darting and wheeling with a grace and precision which no amount of training could impart; the behavior of stampeding sheep or cattle; the conduct of men at a political rally, or at a lynching; these are random examples of a unified type of action characteristic of groups.

It is axiomatic that the mind of the group is a very different thing from the sum of the minds of the individuals composing it. As Le Bon (1897, p. v) observes of crowds, "from the mere fact of their being assembled, there result certain new psychological characteristics . . . (p. 6) just as in chemistry certain elements, when brought into contact—bases and acids, for example—combine to form a new body possessing properties quite different from those of the bodies that have served to form it". But this analogy, admirably as it states the case, hardly helps us towards an explanation of it, since the origin of the new properties insisted upon is quite as obscure in the one instance as in the other.

The special characteristics of organized groups, according to Le Bon (*loc. cit.*), are three: suggestibility, contagion, and the possession of a sort of collective mind. As he announces shortly that contagion is an effect of suggestibility, there seems to be no good reason for considering these items separately; suggestibility, furthermore, can hardly be discussed apart from its relation to the collective mind; the real problem of the group psychologist is, therefore, to find an adequate explanation of the group mind.

It was assumed by the earlier observers, with a placid anthropomorphism, that the animal flock is organized somewhat on the plan of a military company, with a regularly appointed leader who directs the movements of the group by means of signals or even vocal commands. Such a conception seemed particularly plausible in the case of the avian flock, where there is often apparent evidence of a leader and where, moreover, there is unquestionably an exchange of vocal signals more or less meaningful. I recall reading, on one of my first excursions into natural history literature, a learned account of the language of crows, which undertook to explain the flock behavior of these birds on the basis of "caws" of varying number and intensity uttered by the leader, and even ventured a tentative crow-vocabulary. Unfortunately I was unable to profit by this information, as the crows of my acquaintance apparently spoke a different dialect!

With the application of critical methods to the study of animal behavior, it became evident that birds are not diminutive human beings with wings and feathers, and the old explanation was found no longer to suffice. Thereupon the pendulum swung in the opposite direction, and it was insisted that the behavior of the flock, with its unity of impulse and remarkable coördination of

action, is inexplicable in terms of the five senses, and must be based upon principles of which we have no definite knowledge.

As a result of this conception, there has been a tendency to speculation rather than careful study, and certain of the phenomena of group behavior have been adduced as evidence in support of various mystical beliefs.

An English writer who is presumably a very good naturalist has lately advocated the opinion (Newland, 1917, p. 104) that every sentient being is an incarnate fragment of the All Mind; hence the members of a flock act in unison because they are directed by a common intelligence. Still more recently it has been insisted by Long (1919, p. 74 ff.) that a mysterious "natural telepathy" is responsible for the passage of impulses from individual to individual in the animal flock. Dogs, wolves, caribou, Indians and Bushmen, he thinks, are possessed of a "supersense", an extremely useful appurtenance which civilized man has been careless enough to lose. Numerous other examples of more or less extravagant interpretations might be cited.

Unfortunately for such views, the group-mind is not at all the perfect instrument that they assume. It often stumbles in a manner unworthy of an All Mind, and hesitates in a fashion inconsistent with the idea of a perfectly functioning natural telepathy. Furthermore, we are able to trace among gregarious forms a progression from a simple to a complex type of organization; in the case of the more loosely organized groups we are able to explain behavior in terms of known facts of psychology, and it is logical to suppose that greater complexity is a difference, not of kind, but of degree only.

In a previous paper (Miller, 1921) attention has been called to the Bush-tit (*Psaltriparus minimus*) as a bird manifesting a relatively simple and loose flock organization. Coördination here takes place as a rule rather slowly, and the observer is able to witness the actual steps in the process.

When the Bush-tits behave at all as a unit, it is by the method that I have termed the "spread of impulse". If the flock moves from one place to another, it is because one bird, or occasionally two or three birds at a time, are stimulated by hunger to a change of location; the impulse spreads, not telepathically, but through the ordinary channels of sight and hearing, and the flock follows suit. If an enemy appears, it is sighted perhaps by only one or a few of the flock; from them the impulse spreads, almost instantaneously in this case, but through the medium of sound, to the others, so that those birds who may not have seen the enemy unite in the "confusion chorus". There is nothing in their behavior to suggest telepathy, or any mysterious type of psychic communication. Indeed a practised observer is often able, by noting the nature of the initial stimulus, to anticipate the reaction of the flock, although it is hardly to be supposed that he has for the moment become identified with what Newland (*loc. cit.*) has called the "group soul."

The movements of a flock of English Sparrows when unmolested are similar in certain respects to those of a band of Bush-tits; a few birds take the lead and the others follow. Kessel (1921) has observed that the California Valley Quail are "stimulated to flight by the leader," which he suggests further on may be any member of the flock that takes the initiative for the moment. It is stated by Woodward (1921, p. 138) of the collective soaring of gulls that "they start with perhaps a dozen or two birds, but these are soon joined from all directions by other gulls in two's and three's until 100 to 200 birds are in the air at once". Thus the spread of impulse through the group

is by no means a phenomenon peculiar to the Bush-tits, but one appearing in widely separated species of bird.

Elsewhere in the animal kingdom we find parallel examples, suggesting that this type of behavior is still more generally distributed. Dr. E. C. Van Dyke informs me that the saw-fly larvae above referred to do not react simultaneously as has been claimed (Newland, p. 38), but that the impulse can be observed to spread from individual to individual, probably as a tactile stimulus. Groos (1898, p. 208) remarks of gregarious mammals that "the playful act of one animal spreads through the whole company like a sudden contagion", and observes, "when one cow in a herd leaps down the slopes where they are grazing, a large part of the herd will often follow".

The behavior of crowds is essentially a phenomenon of the same sort. We do not see a thousand men become wildly enthused, or angry, or panic stricken in an instant. A few individuals are first moved by these emotions; by voice, or gesture, or appearance, their state of mind is conveyed to their immediate neighbors; the impulse spreads until the whole group is affected; their own shouts and cries excite them further, until we may witness a crowd of intelligent men shortly converted into an unthinking mob, with a unity of purpose which may lead to the most heroic or the most senseless acts.

A "Go West" movement or a Klondike stampede are phenomena essentially similar to the movement of a flock of Bush-tits from one chaparral clump to another.

An analogy may be drawn between spread of impulse in the group and the spread of an impulse through the nervous system of certain invertebrates. In a medusa, for example, or a sea-urchin, the part of the body immediately stimulated first responds; coördination of action takes place slowly, spreading from part to part, until at last the whole organism is in motion. No part controls the rest. No reactions are controlled by the central nervous system. Von Uexküll (1909, p. 118) has called the sea-urchin a "republic of reflexes", and remarks ingeniously that "the legs (spines) move the animal", as contrasted with the higher animals, where "the animal moves the legs". Which ever part takes the lead depends upon circumstances, and the rest of the body gradually coöperates.

Thus there is evident a comparison between coördination of action in a simple animal and coördination of action in the group. The flock behaves as a sort of *primitive organism*.

Indeed it has been insisted by Huxley (1912, Chap. V) that any organized group may rightly be considered a form of individual. Whatever individuality the flock possesses, however, is usually of a very vague and imperfect type; the individualities of the component parts are incompletely merged with the individuality of the whole, and may even come into conflict with it or with one another, as when a band of Bush-tits undertakes to move in two or three directions at once (Miller, 1921, p. 126); "the legs move the animal"; the individuals move the flock, rather than the flock the individuals.

In all the instances cited there is nothing which may not be explained with good reason on the basis of the spread of impulse through normal physical channels. There may indeed be a hyper-sensitiveness to suggestion, a tendency for the individual to be alert and readily responsive to impulses coming from his neighbors, but this, as Trotter (1916, p. 108) observes, is one of the fundamental characteristics of gregarious animals. We have no occasion to

call in the assistance of natural telepathy or any other peculiar psychic force to explain the facts. Such explanations merely reduce the known to terms of the unknown, and claim to have solved the problem when they have only avoided it.

That organized groups are possessed of a more or less definite "aggregate mind" there seems to be ample evidence. That this collective mind exhibits certain peculiar properties distinct from those of the individual minds composing it, few will deny. But that these properties are of a hypnotic (Le Bon, p. 10) or telepathic (Long, *loc. cit.*) nature, satisfactory evidence is lacking. It is the belief of the writer that the spread of impulse—exceedingly rapid in well organized groups, slowly enough to be readily observed in less unified aggregations, but always through the normal channels of sense—is entirely adequate to explain the mind of the flock.

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*Department of Zoology, University of California, October 4, 1921.*

## NESTING PINE GROSBEAKS IN PLUMAS COUNTY, CALIFORNIA

By RICHARD HUNT

IN THE SUMMER of 1920 I went camping with a party of people, ten miles south of Biardsden, Plumas County, in the yellow pine and silver fir belt at an elevation of 6300 feet. The country was attractive from the point of view of the vacationist, with good hiking in all directions and many beautiful little Sierran lakes within easy "striking distance" of camp. My own main idea, like that of the rest, was merely to have a good time, and no ornithological thoughts were uppermost in my mind; but I had not been in camp two minutes before I realized that we were in a region of California Pine Grosbeaks (*Pinicola enucleator californica*).

The first Grosbeak was pointed out to me as I arrived in camp with grip in hand. The bird was a male in red plumage, sitting motionless on a pine branch about 20 feet up, where it remained unconcerned while several of us walked round freely under the tree viewing our visitor from all sides.

Early next morning I woke in my sleeping bag (see editorial note in CONDOR, XXII, 1920, p. 161) and lay there scrutinizing the tree top world above me for bird life. I saw two Pine Grosbeaks fly to a lodge-pole pine sapling, and there was something business-like in their manner of flight that suggested nesting birds. When I was dressed I investigated and found the nest exactly where the birds had flown. They had not approached it by a "trick" route as some birds do. The nest was 20 feet up, and contained three young almost ready to fly. This was on July 12.

Since there were people in the party who would not have appreciated my motives if I had "collected" the grosbeak family together with the nest, and since I myself felt that more might be learned by gathering what little "life history" material I could between hikes and other activities on the camp program, I adopted the "life history" policy. I began by putting in a good deal of spare time trying to get some photographs with the only "camera" I had, a "Brownie 1A Folding". I climbed a neighboring sapling to a level with the nest, and waited for the parent birds to come and feed their young. Two facts made this business harder than it sounds: first, the branches of the tree grew downward so sharply that my feet slipped off, and I had to remain in place by main hug of legs; second, the young were fed only about every twenty minutes. After much waiting and leg discomfort I snapped my kodak at an instant when both parents were perched on the rim of the nest feeding the young. It was a wonderful picture, the only trouble being that it never "came out"! I "took" some more pictures too that were wonderful barring the fact that they did not come out afterwards. As a photographer I later realized that I was registering about zero percent.

Three days later, July 15, the young left the nest. One of them disappeared for good. Another was heard peeping in some alders bordering the camp for two days. The third fell into the hands of the philistines and more or less stayed in camp as general property for two days. For this I was responsible, for I discovered the youngster about ten feet up in a small pine, and climbed up with my kodak, hoping that the parent birds would come with food. The female ventured near, but did not quite dare feed her baby, with me six feet away. So I caught the young bird, who made no effort to elude

me and showed no fear, and placed it on a favorable perch near the ground in camp, where I again waited a long time for the old birds to come. Although they did not seem concerned because I had their offspring, they nevertheless were cautious about venturing too near. Just once the female did come out into the open where the youngster was, and I snapped my kodak at the two side by side on the branch. This picture, like all my others, was excellent, *in itself* and as it existed in nature irrespective of my attempt to *take* it.

There were several children in our party and they all wanted to take turns "having" the young bird. And so for two days it was passed from hand to hand, and was made to perch, peeping plaintively, on wrists and arms and shoulders and hats. Even the older members of the party had to have their turns. One member, a better photographer than I, who also, however, had only a kodak, actually *took* pictures (that "came out" afterwards!) of the bird as it perched on various peoples' hands, heads, etc. During all this handling the little bird remained utterly fearless.

On July 17 it had disappeared. After this date the parent birds were no longer in evidence round camp, our only intimation of their existence being very occasional call notes sounding from well outside the limits of camp. On July 23 I sawed down the empty nest.

Whatever information of interest concerning the California Pine Grosbeak I may have collected during my few days of observation ought to make itself known to the reader as I compare my own experiences with those of some other observers or collectors, especially with the facts recorded by Milton S. Ray (CONDOR, xiv, 1912, pp. 157-187).

In regard to date of breeding, Ray quotes W. W. Price (p. 159) as follows: "They breed late, as attested by two nestlings brought to me July 29 . . .". The first nest that Ray found contained two eggs on June 17, and the second contained three eggs on June 18 (pp. 180 and 182). The Misses Alexander and Kellogg, collecting at Independence Lake, Nevada County, took six full-grown and nearly full-grown young (and four moulting adults) on August 9 and 10 (nine of these in 1910, and one the previous year). My nest, as already stated, contained three young nearly ready to fly on July 12.

As to elevation, Price (as quoted by Ray, p. 158) stated that the bird "is strictly an alpine species; I have never seen it below 7000 feet and I have taken it near the timber-line. It is peculiar to the belt of tamarack pine (*Pinus murrayana*), and the beautiful red alpine fir (*Abies magnifica*), and most of the specimens were taken in groves of this latter tree." The two nestlings mentioned by Price (p. 159) were found "at about 9000 feet elevation." Chester Barlow (as quoted by Ray, p. 161) said that he found Pine Grosbeaks among red firs, and that the bird is "seemingly a species of irregular distribution, not occurring below 6,000 or 7,000 feet." Ray found his first Grosbeak nest at 8500 feet well up toward "the limit of the timber which is at about 9250 feet elevation" and well into the snow belt at the season when found (pp. 177-178). His second nest was also among snow (p. 182) between 7000 and 7600 feet (see table, p. 187), and, I gather (p. 182), among firs and hemlocks. The birds taken by the Misses Alexander and Kellogg, already referred to and comprising in all six full-grown young and four adults (now nos. 10456 and 17113-17121 in the collection of the University of California Museum of Vertebrate Zoology) were collected at 7000 feet. J. Grinnell (pp. 106-107 of his "Distributional List") says, "The lowest elevation in the state at which



the species has been found at any season is Cisco Butte, 6500 feet, Placer County, October 6, 1913 (Mus. Vert. Zool.)." In comparison with all of this, my birds were found at 6300 feet well below the lowest snow patches among lodge-pole pines and silver firs and not far above the highest sugar pines.

The ten birds collected at Independence Lake, Nevada County, constituted the northernmost record of range for this species till my own birds were recorded from the locality already herein referred to in Plumas County.

Various field observers have remarked the Pine Grosbeak's tameness. Price (as quoted by Ray, p. 159) observed that this bird, when visiting salt licks, "was at all times exceedingly fearless and unsuspicious." Ray found his nesting birds so tame that they had to be "urged" off the nest (pp. 180 and 182). In getting pictures of one of the nests (p. 182) "it was necessary in all to flush the bird forty-one times. No photographer could wish for a more willing subject, for she promptly returned on each occasion. The bird was utterly fearless, coming at times very close to us and seeming rather puzzled than alarmed or angered by our aggressive operations." I did not find my nesting birds so tame as all this. Though they never seemed much excited or perturbed, they nevertheless at all times remained prudently at a distance from me when I approached or stayed near the nest or the nestlings.

Price is quoted by Ray (p. 160) in regard to the food of the Pine Grosbeak. "The crop and stomach of an adult contained the soft leaf ends of *Pinus murrayana* and *Abies magnifica*, besides seeds and portions of various insects." I observed my birds nipping off tender buds of fir, and doubtless it was this food, with an admixture perhaps of other material, that I saw them feeding to their young, by regurgitation.

My Pine Grosbeak nest (now no. 1831, Mus. Vert. Zool.) is in a general way like the nests described by Ray (pp. 184-185). It is an outside construction of twigs, lined with small crinkly roots. The outside measurements are 8 inches across by  $3\frac{1}{2}$  deep; the inside,  $3\frac{1}{4}$  diameter by  $1\frac{3}{4}$  deep. The nest was placed on a horizontal forked branch about 3 inches from the main trunk (at this height  $1\frac{3}{8}$  inches in diameter), and supported laterally by branches growing on a level with the rim. It was not attached to its support, but was fairly well *crammed* between the supporting branches and was reasonably firm. The eggs could have been seen through the bottom. It was, as already stated, 20 feet up in a lodge-pole pine: this in comparison to the three heights mentioned by Ray; namely, "on the lower branches of a fir" (p. 159), "sixteen feet up" in a fir (p. 178), and "35 feet up, eight feet from the trunk of" a hemlock (p. 184).

Finally, as to the utterances of the California Pine Grosbeak. The "peculiar melodious twittering" mentioned by Ray (pp. 178 and 183) I do not remember having heard.

The call note I remember well and made records of it on the spot. It most decidedly reminded me of the Western Tanager's note, which I would never think of spelling "churtig" as Ray does (p. 183), but which has at all times sounded to me so nearly like "pretty" that it seems strange that anybody could hear it much differently. The Pine Grosbeak's call so closely resembles this tanager note, in my estimation, that one not knowing otherwise might well conclude that it indicated a family relationship. The Grosbeak's call has still another non-family or "accidental" counterpart in the call of the California Thrasher—the brisk "qui-lit" so well known to most observers. The Gros-

beak note, however, resembles the tanager call more closely than it does the thrasher call. I spelled it *prilly* or *prilleh*. There is something musical or pleasing-to-the-ear in its timbre, as suggested in the letters "r" and "l". The vowel sounds are easily determinable. In manner of delivery it is rather lively, and the expression is somewhat querulous or enquiring.

As to the song, which I had opportunity to hear for many successive days, as sung both by "my" Grosbeak and by others in the same general vicinity: never, by any possible stretch of the imagination did I hear a song in the slightest degree bringing to mind the song of the Black-headed Grosbeak, which Ray (p. 178) says it resembles. It is utterly different in timbre, in form, in pitch—in every essential. The timbre of the Black-headed's song is round and smooth and mellow; that of the Pine's is vibrant and musically rough, or "burred" in a silvery-toned sort of way. The song of the Black-headed is easy and fluent; that of the Pine is forced and fricative. In form I have found the song of the Pine Grosbeak far from the elaborate affair described by Ray. The very longest songs I heard were not "varied" to any notable extent, nor were they prolonged enough to contain a "series" of anything, let alone "trills, warblings and mellow flute-like notes." The typical song, so far as I have been able to discover, is a comparatively short "set song", in general form not unsuggestive of the warble of the Cassin Purple Finch. One song, recorded "from life", ran *pree-pr-pr, pr-pr-pree?* This is perhaps shorter than the usual song, yet not much so, I think. One bird ended its song always with a brave *pree-veur!* in perfect imitation of the Olive-sided Flycatcher, this note standing forth when the rest of the song was damped out by distance. I do not know whether this appropriation of the Olive-sided Flycatcher's call was peculiar to this one individual Pine Grosbeak or whether others do the same thing. Finally, the pitch of the Black-headed's song is comparatively low, with a preponderance of mellow "eu" sounds and others from the same general region. The pitch of the Pine's is comparatively high, and is characterized throughout with long-*e* and short-*i* tonals, perpetuating themselves forcibly as if made to go with great pressure through a musically vibrating small orifice.

*Museum of Vertebrate Zoology, Berkeley, California, September 8, 1921.*

## FROM FIELD AND STUDY

**The Speed of a Flying Dove.**—The automobile has, ere this, been the means of determining the approximate speed of birds (see CONDOR, XXII, p. 186), and once again it comes into play for the same purpose.

The Western Mourning Dove (*Zenaidura macroura marginella*) is considered a fast-flying bird by sportsmen, and it has been said to attain the speed of sixty or seventy miles an hour. This has always seemed an extravagant speculation to me and I firmly believe it so now. That the bird is a difficult wing-shot is due to its erratic flight and small size (feathers not counted) more than to its speed.

This was fairly demonstrated when, on July 28, 1921, I rounded a curve on the boulevard between San Jose and Oakland and almost ran onto a dove. The sudden appearance of the car and noise of the motor frightened the bird so that it crouched for a moment and did not flush until I was almost on top of it. At the moment it flew I slowed down a bit, but the bird was evidently frightened and confused for when it started off to the right, the approaching machine drove it back straight ahead, and an attempt to break to the left resulted likewise. The bird then settled down to the

business of getting away straight ahead. It was flying about twenty-five feet over the road-bed and appeared plainly to be exerting all its energy. During this very short time the bird had gotten about thirty or forty feet ahead of me when I commenced crowding it.

Accelerating my speed until I attained thirty-five miles an hour, I saw I was gaining perceptibly on the bird, and maintained that speed. The dove was evidently resigned to its fate, for it flew straight over the road-bed for about a quarter of a mile, when I came almost under it, and with a violent left-wing stroke it shot off to the right and over the fields. At this instant I was endeavoring to regulate my speed to correspond with that of the bird, but its sudden side-step frustrated this. It is, however, safe to conclude that the dove's flight was in the neighborhood of thirty miles an hour. Certainly it was considerably less than thirty-five miles an hour, and there was no wind to hinder or assist its progress. Moreover its actions were totally unlike those of most doves under similar circumstances. They seldom crouch before flushing, and they usually fly to the right or the left, exhibiting no trace of confusion.

One element of error in the conclusion that the greatest speed of doves is thirty miles an hour remains, namely, that this bird may have been a grown juvenile with as yet undeveloped powers of flight; but it did not appear so to me.—FRANK N. BASSETT, *Alameda, California, August 16, 1921.*

**The Intrepid Pewee.**—During the week, August 15 to 21, 1921, we were in one of the Fallen Leaf Lodge cottages on the edge of Fallen Leaf Lake, Eldorado County, California. The whole country in that section of the state is generally well wooded. Our cottage was in the midst of fairly large forest trees, consisting of white fir, incense cedar and Jeffrey pine. One of the commonest birds about Fallen Leaf Lake is the Western Wood Pewee (*Myiochanes richardsoni richardsoni*), and one bird of this species had the habit of perching at the very top of a small incense cedar, about twenty-five to thirty feet from the ground, and darting off to catch flying insects, often making a single audible snap during the flight, apparently made with the bill at the instant of taking its prey.

This bird made many spirited attacks upon Blue-fronted Jays (*Cyanocitta stelleri frontalis*). The attacks usually consisted of a series of stoops from some distance and my attention was always drawn to the performance by hearing the snapping noise made by the Pewee, which sounded the same as the noise made in seizing an insect, but repeated rapidly during the attacks. It would not be safe to say that the noise was not made with the wings, but I think that it was not; yet I have a doubt on this point, which I was not able to clear up. Several times the Pewee was seen following flying Jays, but it was not clear whether the Jay was fleeing or the Pewee merely following. In these attacks the Pewee displayed the utmost dexterity, passing through the crowns of the trees without any perceptible loss of speed and dashing directly at, or very close to, the enemy. Its swiftness and accuracy of flight were not less admirable than its intrepid spirit.

The reaction of the Jays to these attacks was to move off as if annoyed or disturbed rather than alarmed, but in some instances the Jays moved off fast enough to give the impression of rapid retreat. The attacks always persisted until the Jay or Jays attacked had left. Once I witnessed an attack upon two Jays and again upon three, neither the size nor the number of enemies seeming to deter the truculence of the diminutive aggressor. This Pewee was under observation for short periods every day for a week and nothing about its behavior indicated that it had a nest or young to protect, and it seemed evident that the attacks on the Jays were entirely offensive.—CLAUDE GIGNOUX, *Berkeley, California, September 17, 1921.*

**Birds and Oil in Oklahoma.**—Floating oil on the Pacific is not the only trap which birds must avoid if they would live; for in Kansas, Oklahoma and Texas the same sorts of traps exist and annually destroy a considerable quantity of bird-life.

In an oil field there is an inevitable waste of oil. This waste is caused by wild wells, leakage in tanks and pipe lines, cleaning out of old wells, tanks and lines, and simple abandonment of non-merchantable oil. All of this waste collects in artificial ponds which lie along natural drainage courses and after a few weeks standing becomes thick and gummy through the evaporation of the lighter constituents. From the air

these ponds appear as blue as ponds of water and they undoubtedly attract water fowl.

The smaller sandpipers, when migrating, fall prey to these traps in larger numbers than all other birds collectively. This is probably due to their habit of wading along the shallow margins of ponds in search of their food. I have seen ducks descend as if to alight in oil ponds, but they never do; they must be warned in time by odor or some non-attractive appearance the pond may have. The larger waders get their feet oiled up but not the plumage.

There is no remedy for this condition and the wild life will have to suffer its continuance as it does telegraph wires, light houses and the like.—J. R. PEMBERTON, *Tulsa, Oklahoma, August 21, 1921.*

**Least Tern Feeding Young on September 25.**—All during the early part of September, 1921, Least Terns (*Sterna antillarum*) were still feeding young at Carpinteria, Santa Barbara County, California. On September 25, one adult was still feeding a single young bird. The adult brought small fish at intervals of about twenty minutes to a flat in a lagoon where the young bird waited. At the approach of the parent the young bird uttered the characteristic *kit-tick*, opened its mouth and spread its wings. After feeding the young bird, the parent always dipped its bill two or three times in the lagoon as it flew off. Once the parent alighted in the lagoon and bathed. The young bird joined it, and both floated and splashed a moment or two.—RALPH HOFFMANN, *Carpinteria, California, September 25, 1921.*

**On the Occurrence of the Buffle-head at Eagle Lake.**—The article by Mr. Dixon in the last CONDOR was read with particular interest because of the fact that we had

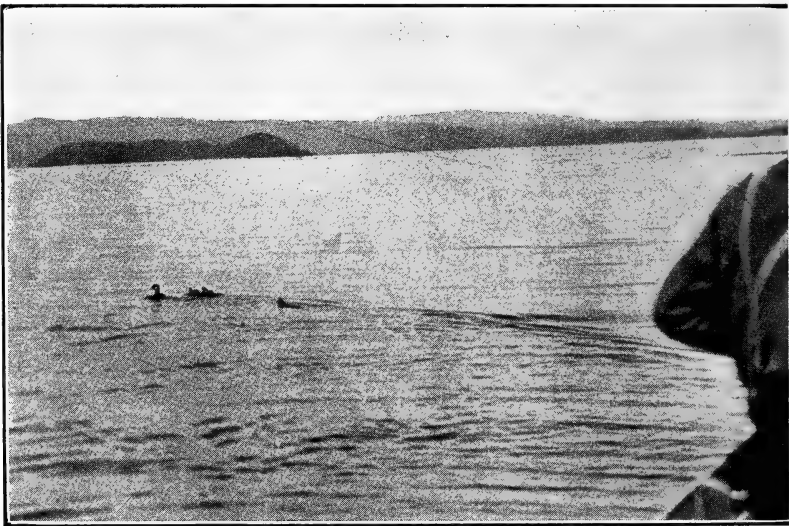


Fig. 32. IN PURSUIT OF THE BUFFLE-HEAD, WITH YOUNG, ON EAGLE LAKE, CALIFORNIA, MAY 27, 1921.

noted a pair of these ducks with young on the lake prior to Mr. Dixon's visit. Our party, consisting of Messrs. Jules Labarthe, Sr. and Jr., and the writer, after an extended collecting trip in northern California and southern Oregon, on our way south, encamped at the lake for a few days. May 27 (1921) was spent on a trip to the islands along the east shore of Eagle Lake. Here we found Farallon Cormorants with everything from newly built nests to those with half-grown young. The California Gulls, however, were

just beginning to lay, while in the great rookery of American White Pelicans we were surprised to find that every set of eggs (and there were scores) had been destroyed by some undetermined agency.

While rowing along the island shore we came upon a female *Charitonetta albeola* with eight small young. We realized the species had not hitherto been recorded from the state as a breeding bird, and knowing, too, that all records are best when backed by proof we started in immediate and, I fear, rather noisy pursuit in an endeavor to secure photographs. The best of these are shown herewith. In the excitement of the chase two of the juveniles became separated from the brood and some time later were discovered close to the island shore. Here, tireless efforts on the part of Jules, Jr. (for the speed with which they could swim and dive was a revelation) resulted in their capture and in their later posing, unwillingly, before the graflex.

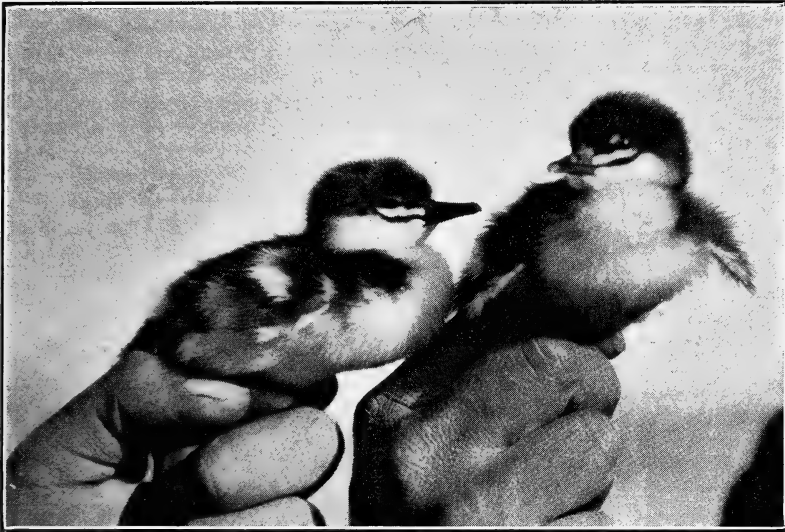


Fig. 33. YOUNG BUFFLE-HEAD DUCKS, CAPTURED BY JULES LABARTHE, JR., AT EAGLE LAKE, MAY 27, 1921.

Photo by Jules Labarthe, Sr.

Eventually the ducklings were released and with seeming joy and great speed they paddled to their parents (for the strikingly marked male, too, had now made his appearance); and in a small lake of the island (or neck of mainland, we never determined which) they then all cruised around contentedly after their most spirited adventure.

Later a storm arose on the lake, and the high waves rapidly filling our boat on the journey homeward we were forced to return to the isle. Here we were marooned, provisionless, for the rest of the day. Late in the evening we rowed back to our camp against a rough sea in pitchy darkness, an experience that was all too thrilling for pleasure.—MILTON S. RAY, *San Francisco, California, October 6, 1921.*

**The Sabine Gull in Southern California.**—I wish to report two Sabine Gulls (*Xema sabini*) seen at Anaheim Landing, August 30, 1921. Three members of the Los Angeles Audubon Society, Mesdames C. H. Hall, A. J. Mix and F. T. Bicknell, at 11 a. m. saw what at a distance resembled a Bonaparte Gull on account of its dark head. The bird was alone and constantly preening its feathers. Moving forward quietly, the observers approached within thirty feet or less and studied the bird at leisure with binoculars for at least twenty minutes. They followed it slowly along the water's edge, trying several times, without frightening it, to put it to flight; but with a flight of a few feet, it would settle on the beach again. It seemed tired as from a long flight.

The slaty hood bordered at base with black, the dark gray mantle and black outer wing quills, with inner webs and tips white, were unmistakable; and its slightly forked tail, black feet and black bill tipped with yellow, were easily noted and identified the bird as still in summer plumage.

At 2 p. m. the same day, farther down the coast, between Anaheim Landing and Seal Beach, a second Sabine Gull was studied; it was in the winter plumage, only a remnant of the dusky hood on back of head and slaty ear coverts remaining. It, too, seemed worn with long flight, allowing the Audubonites to approach within fifty feet, where a good study was made. A Western Gull was patrolling the beach in lordly style and ordered the Sabine to "move on", emphasizing the command with ruffled plumage and open bill attacks. Neither of the Sabines were feeding.

This report was telephoned to Mr. L. E. Wyman, Ornithologist of the Los Angeles Museum, the same evening before any books were consulted and his questions were answered from notes made of the birds as studied first-hand in the field. He did not question the identification.—MRS. F. T. BICKNELL, *Los Angeles, California, September 1, 1921.*

**The Gray Vireo in Los Angeles County, California.**—On May 31, 1921, I discovered a Gray Vireo (*Vireo vicinior*) in Mint Canyon, twelve miles from Saugus, California. So far as I am able to learn, this species has not previously been recorded west of the Cajon Pass region, which is some fifty miles east of Saugus. The bird was not taken, but it was studied for three hours under favorable conditions. Only the one bird was seen, presumably the male, as it was in full song. It had established a station in the chamisal among typical "gray vireo conditions". From this station it was driven again and again only to return to the same point each time. Prolonged search failed to reveal the nest although it seemed certain that one must be located within a short distance. Identification was based upon song, the ashy gray color, and persistence in plant association all made more or less familiar through previous acquaintance in Arizona and in the Cajon Pass country.—LOYE MILLER, *Southern Branch, University of California, Los Angeles, September 19, 1921.*

**Eclipse Plumage of Cinnamon Teal.**—On July 11, 1921, A. W. Anthony, H. C. Cleaves and I explored Cuyamaca Reservoir, a lake in the Cuyamaca Mountains, San Diego county, for material for a habitat group of grebes for the Natural History Museum of San Diego. A year previously I had found grebes breeding abundantly in the tule patches covering several acres at the east end of the lake. Last winter's rains were scanty here and the steady draft on the water of the reservoir had lowered the water so much that the tule patches were high and dry and the grebes had gone elsewhere, though we did see a brood or two, too large for our purpose.

Several broods of young ducks were present and I saw a group of three Cinnamon Teal (*Querquedula cyanoptera*) that I thought were nearly grown and shot two of them. These proved to be adults in a stage of plumage new to me. On skinning them I found both to be males. They are in the "eclipse" plumage which is undescribed in any publication accessible to me here. Probably individuals will vary somewhat, as is the case with these two birds. No. 7455 may be described as follows:

Similar to the usual female plumage; crown and nape dark brown; sides of head, throat and neck a pepper-and-salt mixture of dull cinnamon and light gray speckled with blackish; back and rump as in the spring plumage except that the mottling is coarser and the light edgings to the feathers narrower; the wings and tail are not yet molted and perhaps would not show any changes; plumage of breast and lower surface similar to that of the female and immature male, the feathers being brown centrally, with lighter edgings; this edging is dull pale cinnamon on the breast, passing to light gray and dull white on the belly. There are a few small patches of the old cinnamon plumage on the sides. The lower surface of the other bird is still nearly half cinnamon colored. It had yellowish brown irises, while those of no. 7455 were red.—FRANK STEPHENS, *San Diego, California, August 17, 1921.*

**Concerning Incubation on the Part of the Male Belted Kingfisher.\***—In the volume entitled "Michigan Bird Life", by Professor Walter Barrows, published in 1912 by the Department of Zoology and Physiology of the Michigan Agricultural College, under the head of Kingfisher (*Ceryle alcyon*), on page 343, the statement is made that "The female alone incubates, but the male carries food to her at frequent intervals." This may have been taken from Bendire's "Life Histories of North American Birds", in which

\*Contribution from the Museum of the California Academy of Sciences.

the latter author says, page 38, "The male does not assist in incubation, but supplies its mate with food while so engaged, and she rarely leaves the nest after the first egg has been laid; at any rate I have invariably found the bird at home if there were any eggs in the nest". Major Bendire is referred to in the sentence just previous to the one first quoted above.

For more light on this subject I have recently looked up far too many authorities to mention in this brief article, but the only other reference to the matter of the incubating habits of this species that I have so far found is in Nuttall's "Manual of the Ornithology of the United States and Canada", 2nd edition, page 720, where it says "incubation, in which both parents engage, continues for 16 days". So here are two well known ornithologists responsible for absolutely contradictory statements! The matter is "side-stepped" by every other authority that I have consulted.

Now it happened on June 24, 1921, that Dr. G. Dallas Hanna, of the California Academy of Sciences, my brother, John W. Mailliard, and I were lunching at noon time in the bed of Nicasio Creek, Marin County, California, at the base of Black Mountain, and while so occupied noticed a Belted Kingfisher fly into a hole in the opposite bank. Soon after finishing lunch we proceeded to investigate this matter and discovered a nest containing five eggs, about one-third incubated, with the male bird in the tunnel and apparently on the nest. This tunnel was about ten feet long and only twelve or fourteen inches below the surface of the ground, which was rather sandy and friable, and the cavity was easily pried open by means of an old fence picket.

The bird did not attempt to leave until the nest was almost reached in the upheaving process. As it flew off it was secured for evidence and proved to be the male, with the abdominal region partially bare, as if from sitting on the eggs.

Earlier in the day two kingfishers had been observed flying up and down the creek, and shortly before lunch a female had been taken as it perched for a moment on a snag about seventy-five yards below the nest, which we had not at that time discovered. This female was apparently the other owner, yet showed practically no sign of having been incubating, as the plumage upon the abdomen was in a good state of preservation.

While this matter is not one of great importance it is one of some interest and, as part of the life history of a well known bird, might as well be cleared up if possible, hence this short paper is written in the hope that some other observer, who may have had better opportunities to study the question, may come forward with sufficient evidence to prove the point one way or the other.—JOSEPH MAILLIARD, *San Francisco, California, August 10, 1921.*

**Eastern Kingbird at Mono Lake.**—On July 19, 1921, I saw an Eastern Kingbird (*Tyrannus tyrannus*) near Mono Lake, Mono County, California. In Grinnell's Distributional List (1915), there are only two records for the bird from California.—RALPH HOFFMANN, *Carpenteria, California, September 25, 1921.*

**Chronicle of Additions and Eliminations Pertaining to the California State List of Birds.**—The present note carries the chronicle of the birds of California forward from Pacific Coast Avifauna no. 11 (1915) and from my supplementary note in THE CONDOR of January, 1919 (vol. xxi, pp. 41-42) to October 15, 1921. I have followed the rule of letting all definite proposals "ride", as if the findings set forth were final in every respect, unless and until someone has brought forward good reasons for doubting the conclusions involved. No attention is here paid to mere changes in names; only the addition or subtraction of "concepts" of species or subspecies is considered.

#### ADDITIONS

1. *Larus occidentalis livens* Dwight. Dark-mantled Western Gull. (See Dwight, Proc. Biol. Soc. Wash., vol. 32, February 14, 1919, p. 11.)
2. *Phaethon aethereus* Linnaeus. Red-billed Tropic Bird. (See Law, Condor, xxi, March, 1919, p. 88.)
3. *Chen caerulescens* (Linnaeus). Blue Goose. (See Grinnell, Condor, xxii, March, 1920, p. 76.)
4. *Polyborus cheriway* (Jacquin). Audubon Caracara. (See Heath, Condor, xxi, March, 1919, p. 125.)
5. *Otus asio macfarlanei* (Brewster). MacFarlane Screech Owl. (See Grinnell, Condor, xxi, July, 1919, p. 173.)



6. *Bubo virginianus occidentalis* Stone. Rocky Mountain Horned Owl. (See Swarth, Condor, xxiii, July, 1921, p. 136.)
7. *Otocoris alpestris sierrae* Oberholser. Sierra Horned Lark. (See Oberholser, Condor, xxii, January, 1920, p. 34.)
8. *Euphagus cyanocephalus minusculus* Grinnell. California Brewer Blackbird. (See Grinnell, Condor, xxii, July, 1920, p. 153.)
9. *Passerculus sandwichensis brooksi* Bishop. Dwarf Savannah Sparrow. (See Bishop, Condor, xvii, September, 1915, p. 187, and Mailliard, Condor, xxiii, September, 1921, p. 164.)
10. *Passerella iliaca fulva* Swarth. Warner Mountains Fox Sparrow. (See Swarth, Proc. Biol. Soc. Wash., vol. 31, December 30, 1918, p. 162.)
11. *Passerella iliaca canescens* Swarth. White Mountains Fox Sparrow. (See Swarth, Proc. Biol. Soc. Wash., vol. 31, December 30, 1918, p. 163.)
12. *Passerella iliaca mariposae* Swarth. Yosemite Fox Sparrow. (See Swarth, Proc. Biol. Soc. Wash., vol. 31, December 30, 1918, p. 161.)
13. *Piranga rubra rubra* (Linnaeus). Summer Tanager. (See Miller, Condor, xxi, May, 1919, p. 129; *idem*, xxii, March, 1920, p. 78.)
14. *Petrochelidon albifrons hypopolia* Oberholser. Northwestern Cliff Swallow. (See Oberholser, Canadian Field-Naturalist, xxxiii, November, 1919, p. 95.)
15. *Toxostoma curvirostre palmeri* (Coues). Palmer Thrasher. (See Huey, Condor, xxii, March, 1920, p. 73.)

## ELIMINATIONS

1. *Numenius americanus occidentalis* Woodhouse. Lesser Long-billed Curlew. [Leaving simply *Numenius americanus* as the species, Long-billed Curlew.] (See Grinnell, Condor, xxiii, January, 1921, p. 21.)
2. *Toxostoma redivivum pasadenense* (Grinnell). Pasadena Thrasher. [Leaving *Toxostoma redivivum redivivum* as the California Thrasher throughout the coastal and west-Sierran parts of the state south of the San Francisco Bay region.] (See Oberholser, Auk, xxxv, January, 1918, p. 52, and Grinnell, Condor, xxiii, September, 1921, p. 165.)
3. *Heleodytes brunneicapillus bryanti* Anthony. Bryant Cactus Wren. (See Grinnell, Condor, xxiii, September, 1921, p. 169.)

With the 15 additions and the 3 eliminations specified above, the net increment is 12; this number added to the total of 564 (in January, 1919) makes a present state list of 576 species and subspecies.—J. GRINNELL, *Museum of Vertebrate Zoology, Berkeley, California, October 15, 1921.*

**Bird Banding.**—The writer recently suggested to the Editor that a definite place in THE CONDOR, the same position in each issue, be assigned to the publication of records of birds banded in the western states. Stimulation of the movement should result, and one actively engaged in banding or in taking specimens would have a reference list instantly at hand when he captured a bird banded by another. The plan was accepted on condition that the writer "function as furnisher" of copy for such column, and place for recording such data has been assigned to the last page of "From Field and Study" department.

Will those who are banding, or who have banded, birds, or who have taken banded birds alive or dead, please send to the appended address full data with regard to same, in order that it may be published without delay? The United States Biological Survey, Washington, D. C., will furnish bands and full information with regard to their use to any one who is interested. Report through CONDOR columns will not in any way replace, of course, the rendering of reports to the Biological Survey, or prevent the further use of the data by those who furnish it, but will merely constitute a local "clearing house" for such data.

Mr. S. Prentiss Baldwin has demonstrated (see various articles in the *Auk* and elsewhere) the value of data thus obtained, even by one working alone. Naturally the results can be greatly multiplied by the coöperation of those at many points, particularly in our western states, where migration routes and local distribution are doubtless affected by topographical features.—J. EUGENE LAW, 333 S. Van Ness Ave., Los Angeles, California, October 3, 1921.

## RECORD OF BIRDS BANDED

(Bands: 28811-28819, 48101-48119, 52201-52230, 56421, 56426.)

J. E. Law, at Berkeley, Calif., February 22 to March 25, 1921:

*Zonotrichia coronata*, (3) 52206,-10,-11.*Junco oreganus* (subsp.), (12), 48101-48112.*Passerella i. fuliginosa*, (2) 52207,-09.*Passerella i. sinuosa*, (1) 52204.

At Bluff Lake, San Bernardino Mts., Calif., August 21 to 30, 1921:

*Junco o. thurberi*, (9) 48113-48119, 52212,-13.*Passerella i. stephensi*, (1) 52219.*Pipilo c. crissalis*, (4) 52201,-02,-08, 56426.*Pipilo m. falcifer*, (2) 52203,-05.*Ixoreus naevius* (subsp.), (1) 56421.*Oreospiza chlorura*, (25) 28811-28819, 52214-52218, 52220-52230.

## EDITORIAL NOTES AND NEWS

It seems curious, when one comes to think of it, how prevalent has become the notion among amateur observers of birds that the field-glass is an indispensable part of their equipment. There is, to be sure, no question but that the field-glass is very helpful to many individual observers, and that for purposes of patient and *detailed* study of the behavior of birds in the wild it is truly essential to the few persons who engage in such close studies. But the claim that the field-glass is at all "necessary" to the average run of field observers is, we believe, unjustified. We even aver that addiction to the use of the instrument in question is a hindrance rather than a help in the enjoyment of birds out-of-doors, as well as in the gathering of many of the facts of scientific value concerning them. Our point is that birds out-of-doors are things that in better degree than most other living beings can be seen and watched with the unaided human eye. And what humans need right now is to exercise their senses of sight and hearing in normal fashion—to get away from all those artificialities which go to make up the oppressing burden of "civilization". Bird study afield should take its place as a wholly *natural* recreation, because the nervous and muscular activities which it brings into play are of primitive sorts. Their exercise will tend to restore the proper balance of mind and body, in just so far as they are used in a perfectly normal way. The use of glasses, save in cases of injury or disease on the part of the observer, detracts from the full measure of benefit to be derived. As regards the element of sport in identifying species, there is surely far more "good fun" in naming the birds without the use of any artificial device. Furthermore, the person who is dependent only on his naked eye can make a bigger census both of individuals and species. At least, the most accurate and at the same time rapid bird-counter we know personally,

uses no glasses. And as for gathering facts in regard to behavior of birds, dependence upon glasses means cutting out a lot of the horizon, failure of appreciation of goings on at large while focussed upon details. We have been impressed with the number of things our opera-glass companion did *not* see, at least as much as with the number of things he said he saw that we without glasses had failed to see!

Attention is directed to Mr. Law's note upon bird banding on page 196 of this issue. Here is a method of bird study that should appeal to those who wish to contribute observations of value, yet without killing birds. The possibilities of such work have already been well demonstrated by Mr. S. Prentiss Baldwin (see his *Bird Banding by Means of Systematic Trapping*, Proceedings Linnaean Society of New York, December, 1919; *Recent Returns from Trapping and Banding Birds*, Auk, April, 1921, pp. 228-237; *The Marriage Relations of the House Wren*, *idem*, pp. 237-244). The United States Biological Survey stands ready to coöperate with anyone taking up the work, and *THE CONDOR*, through Mr. Law, will supply space in its columns for the record of birds as banded locally and of banded birds later recorded.

In building their new home, at Jennings Lake, near Portland, Oregon, Mr. and Mrs. William L. Finley have provided a concrete vault for the safe housing of films and records. Their collections now contain close to 200,000 feet of movie negative of birds and mammals, as well as some 10,000 still-life negatives. Last spring and early summer were spent in southern California where some good pictures were secured.

A most deplorable piece of bad luck happened to Mr. Allan Brooks the past summer, of which we only recently heard in a

roundabout manner. Fire broke out in his workshop at Okanagan Landing, British Columbia, and destroyed a part of his ornithological collections including some 2000 skins gathered in his boyhood years. Mr. Brooks's hands were pretty badly burned, but their recovery has been rapid and practically complete, so that his capacity for drawing is in no degree lessened, as might have been feared.

The index to the current volume of THE CONDOR appearing in this issue was prepared by Mr. J. R. Pemberton in his usual painstaking manner. To him we extend our best thanks.

The National Academy of Sciences, Washington, D. C., has issued as its First Memoir, Volume XVI, a brochure entitled "Lower California and Its Natural Resources"; author, Edward W. Nelson, Chief, Bureau of Biological Survey. The contribution is of quarto size and comprises 194 pages and 35 plates. Our copy was received July 5, 1921. Rarely have we read a more fascinating work, for it was written by a true naturalist, based upon personal field experience, and is a straightforward, informative account. In 1905 and 1906 Dr. Nelson accompanied by Mr. E. A. Goldman traversed the entire peninsula of Lower California, their route being shown on an excellent map constituting one of the plates in the report under review. Topography, climate, plant life, animal life, faunal districts, life zones, history of explorations, and agricultural features are among the topics dealt with. The splendid photographic reproductions supplement the text. Lists of the birds, mammals, reptiles and amphibians are given for the different areas. And there is a colored map of the life zones. The paper terminates with a very full bibliography of titles relating in general to Lower California, and to its vertebrate zoology in particular. Because of the immediate contiguity of the territory covered by Dr. Nelson's monograph, ornithologists in the southwestern United States will want to acquaint themselves promptly with this notable contribution.

The death of Judge Edward Wall occurred at San Bernardino, California, September 23, 1921. He was born in the same city, June 29, 1873. "Ed" Wall, as he was familiarly known, was one of the early members of the Cooper Ornithological Club, back in the 90's, though his membership subsequently lapsed for a time. In those early years he was one of the "collecting fraternity" which thrived in the neighborhood of Riverside, Redlands and San Bernardino, and from whose ranks came several men of

recent scientific eminence. Ed Wall, however, specialized in journalism and in the law, in which fields he won marked recognition. For the past six years or so, Judge Wall's early inclinations toward bird study were reasserting themselves, as attested by reaffiliation with the Club (in 1913) and by articles which have appeared under his authorship in THE CONDOR.

Mr. C. de Blois Green spent some weeks during the past summer upon Porcher Island, near Prince Rupert, British Columbia, in search mainly of eggs of the Marbled Murrelet. He was successful in learning hitherto unknown facts regarding the breeding of this elusive though common bird, the eggs of which have not yet, to our knowledge, been taken.

Part XII (vol. II, pp. 257-352, pl. 6) of Witherby's "Practical Handbook of British Birds" was published on October 5, 1921. In all respects, the issuance of this work begun some three years ago is proceeding according to announcement (see Condor, XXI, 1919, p. 174). Six more parts are in prospect. The present installment includes most of the ducks, and from the American standpoint is of special interest as affording detailed description of the eclipse plumage in many of our own species and as discussing the status of American and Old World races where such occur. For example, the American Pintail is commented upon under the accepted name *Anas acuta tzitzihua*.

Mr. R. H. Palmer, formerly of Pocatello, Idaho, and more recently of the University of Washington, Seattle, has gone to the City of Mexico, where he has received a commission to carry on geological work for the Mexican Government. He plans to embrace the opportunity of doing some ornithological collecting as well.

#### PUBLICATIONS REVIEWED

FIRST INSTALLMENTS OF DAWSON'S BIRDS OF CALIFORNIA.—The first two "parts" of "The Birds of California", by William Leon Dawson, reached our office on February 23 and March 16, respectively. Each part comprises 64 pages of main text, the two together being paged continuously from 1 to 128, inclusive. There is naturally as yet no title page to be cited; the covers with their announcements are to be considered merely temporary—in the nature of publisher's advertising, as is the customary thing in similar cases.

In addition to numerous half-tone illus-

trations (unnumbered) in the text, there are several full-page inserted plates, unnumbered. We have seen copies of two editions, the "Booklovers'" and the "Presentation" ("Format de Luxe"). These are identical as to printed matter save that in the first named edition, the two parts contain three colored plates and one photographic plate while in the "de Luxe" they include nine colored and four photographic plates.

The outstanding features of Dawson's work, as indicated by these initial offerings, are the extraordinary abundance and excellence of the illustrations, and the vigorous literary style characterizing the text. Words fail us to express adequately our admiration of practically every one of the large number of photographic studies, either from the artistic or the natural history standpoint; usually it is from both standpoints. The best we can do is to refer to a few of the pictures which happen to have afforded us particular pleasure in their contemplation.

The full-page photograph by the author (p. 106) captioned "A Tempest of Blackbirds" affords endless material for study of flight attitudes of Red-wings. The Brewer Blackbirds foraging and bathing with perfect obliviousness "in the estero" (p. 87) and also those on the telephone wires (p. 85), with suggestive caption "High Notes", call to mind these exact scenes from one's own experience. Dawson's photograph of "A Flight of Western Crows" in Santa Barbara County (p. 17) and that of "Ravens at Play" in Los Angeles County (p. 8) are both, to our mind, of exceptional merit.

Perhaps the rarest bird photograph ever secured is that of a California Jay *in the act* of taking an egg out of a Black-headed Grosbeak's nest. An excellently executed photogravure plate is assigned to this study. Donald R. Dickey was the lucky photographer; we wish we could be told the "story" as to just how he obtained this picture.

Then there are the fine colored plates, from water-color drawings by Allan Brooks. (There are some text illustrations from black-and-white drawings by the same artist, as well.) It is difficult to say which of these plates is best. Possibly the Scott Oriole plate takes first place; but all are in every respect on a very high plane.

As to general plan of treatment for each species, "The Birds of California" follows closely that employed in Dawson's "Birds of Washington". A series of small-type paragraphs contains information of a popularly less assimilable kind, and this is followed by the running, "readable" account of the

species. Page 1 begins at the other end of the list as regards phylogenetic sequence of species, namely with the Raven instead of a Grebe; and of this departure from the usual custom, especially in a popular work, we heartily approve. The full species covered in the two parts at hand number just twenty, representing the Corvidae and most of the Icteridae.

The accounts of species vary considerably in merit; some, for instance that of the Tricolored Blackbird, approach exhaustiveness; others, for example that of the Steller Jay, fall far short of being a full treatment. We would not have ventured this criticism if it weren't for the claim of scientific and popular completeness set forth on the cover—which inscription we hope will be left off from the permanent title page. All bird students together can hardly be said to possess a "complete" knowledge of even our best-known birds. And several of the accounts in "The Birds of California" are only fragmentary as compared with the total of information already *published* in regard to the species concerned.

As previously intimated, Dawson's literary style is vigorous. There is an abundance of allusion and of figures of speech, as a rule hitting off most aptly the peculiarities of behavior and temperament of the bird dealt with. We think that the author is about at his best in his account of the California Jay. Particular phrases or modes of expression, which must be read with the context to be appreciated, portray the bird with thrilling vividness. Personal reaction to the Dawsonian style will of course vary infinitely; but as far as our acquaintance extends, we know of no one who has not enthused over the majority of the text accounts in "The Birds of California". We will confess that now and then an extreme expression has struck us as unfortunate. One account, that of the Cowbird, is rather full of extravagant language; and also, humanistic terms are employed to a degree that makes it to us displeasing. The fact that the Cowbird constitutes a very interesting type of bird, biologically, is scarcely to be detected amid the mass of maledictious verbiage.

Here and there the philosophically inclined reader will find suggestions or bits of theorizing that are pleasingly stimulative. The author's ideas with regard to the phylogeny of the Yellow-billed Magpie constitute a case in point; and another is comprised in the population-estimates of the California Jay. Dawson has very positive beliefs as to the baneful relationships of

the jays to other birds. His figures as to the destruction of birds' eggs by jays are interesting but in all likelihood excessive.

Taken as a whole, these first fascicles of Dawson's "Birds of California" are quite acceptable, more especially from the standpoint of the esthetic enjoyment of bird study. The typography and make-up are neat, and satisfyingly free from error. We hope that the undertaking will come to completion without further delay, and with the same plane of merit sustained to the end.—J. GRINNELL.

#### MINUTES OF COOPER CLUB MEETINGS

##### SOUTHERN DIVISION

AUGUST (meeting for July).—Regular monthly meeting of Southern Division Cooper Ornithological Club was held at the Los Angeles Museum at 8:00 P. M., August 2, 1921. In the absence of both presiding officers, Mr. G. Frean Morcom was acclaimed chairman. Other members present were: Messrs. Chambers, de Groot, Hanaford, Howell, King, Lamb, Law, Robertson, Trenor, Wheeler and Wyman; Mrs. Law and Miss Germain. Mrs. Wheeler and Mr. Enochs were visitors.

Minutes of the July meeting were read and approved. New applications for membership were presented as follows: Miss Marie Pauline Coppee, Ross, Marin County, by Miss Miller; Rex P. Enochs, 715 So. Hope St., Los Angeles, by L. E. Wyman; Walter Mackay Case, Box 399, Prescott, Ariz., and Joseph Edward Hallinen, Cooperton, Kiowa County, Okla., by W. Lee Chambers; Mary Caroline Coman, 1644 Berkeley Ave., Stockton, by Tracy I. Storer; Mrs. Wm. Clark Brown, 945 Orange St., Los Angeles, by H. C. Bryant. The names of Robert Cunningham Miller and Wm. Polk Farber, of Berkeley; and Mrs. Mildred Tiffany Wood, Hopland, were received from the Northern Division.

Formal business ended, members who had recently been a-field related some interesting experiences and observations. Adjourned.—L. E. WYMAN, *Secretary*.

AUGUST.—Regular monthly meeting of the Cooper Ornithological Club, Southern Division, was held at the Los Angeles Museum at 8:00 P. M., August 25, 1921. In the absence of both presiding officers, Dr. L. H. Miller was acclaimed chairman of the meeting. Other members present were: Messrs. Chambers, Edwards, Warmer, Wheeler and Wyman; Mesdames Brown and Warmer; Misses Beers and Pratt. Mrs. Beers, Mrs. Wheeler, Alden Miller and Mr. Patterson were visitors.

Minutes of the July meeting were read and approved, and those of the Northern Division for July were read. Names presented for membership were: Miss Coral Canby, San Fernando, by R. C. Ross; John Jonas, 215 West Park St., Livingston, Mont., by E. R. Warren; Otis Howard Wade, 1353 Vine St., Los Angeles, by W. Lee Chambers.

The Secretary announced that the missing parts of *The Auk*, needed to complete the set belonging to the Southern Division, had been donated by members. An invitation from Dr. Miller to the Club to hold its September meeting at his home, on the Arroyo Seco, was unanimously accepted.

Formal business completed, members who had recently returned from their summer outings contributed to a half hour of informal bird talk. Adjourned.—L. E. WYMAN, *Secretary*.

SEPTEMBER.—The regular monthly meeting of the Cooper Ornithological Club, Southern Division, was held at 3:00 P. M., September 25, 1921, at the home of Dr. L. H. Miller, on the Arroyo Seco, Los Angeles. In the continued absence of both presiding officers, Dr. Miller was appropriately called to the chair. As testifying to the popularity of the occasion, about sixty members and friends attended.

Since the meeting was more than ordinarily of a social nature, formal business was limited to reading of minutes of the August meeting, and presentation of three new names, as follows: Mrs. Josephine Jackson Bates, 1267 Sunset Ave., Pasadena, and Miss Jessica A. Potter, 1118 Santee St., Los Angeles, by Miss Mary Mann Miller; and Mrs. Adelaide R. Bartlett, Assessor's Office, City Hall, San Francisco, by W. Lee Chambers.

Numerous members then contributed their most interesting recent observations, among them a record of the Sabine Gull near Los Angeles, by Mrs. Bicknell; mating antics of juvenile Anna Hummers, by Miss Miller; and feeding habits of the Black Phoebe, by Mrs. Terry. Mr. Law then spoke of the entertainment and knowledge derived from bird-banding, giving results of some recent work in this line, and exhibiting the traps used for the purpose. Dr. Warmer stated that homing pigeons used during the Great War were now on exhibition at Arcadia Balloon Station, near this city.

On motion by Laurence Peyton the meeting adjourned to the informality of a water melon feast, without which this annual event would be incomplete. Adjourned.—L. E. WYMAN, *Secretary*.

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# THE CONDOR

A Magazine of Western  
Ornithology



Volume XXIV

January-February, 1922

Number 1



W.K.F.

COOPER ORNITHOLOGICAL CLUB

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A Magazine of Western Ornithology  
Published Bi-Monthly by the Cooper Ornithological Club

Entered as second-class matter January 25, 1922, at the post-office at Pasadena, California, under Act of Congress of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized January 5, 1921.

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W. LEE CHAMBERS, Business Manager, Altadena, Los Angeles County, California.

Issued January 25, 1922

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Respectfully submitted,

THE EDITORS OF THE CONDOR.

# THE CONDOR

A Magazine of Western  
Ornithology



Volume XXIV

March-April, 1922

Number 2



COOPER ORNITHOLOGICAL CLUB

APR 13 1922

National Museum

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Ornithology



Volume XXIV

May-June, 1922

Number 3



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# THE CONDOR

## A MAGAZINE OF WESTERN ORNITHOLOGY

Edited by  
Joseph Grinnell

Harry S. Swarth  
Associate Editor

J. Eugene Law  
W. Lee Chambers  
Business Managers

Volume XXIV  
1922



Published Bi-monthly  
by the  
Cooper Ornithological Club  
Berkeley, California



# THE CONDOR

A Bi-Monthly Magazine of  
Western Ornithology

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Volume XXIV

January-February, 1922

Number 1

[Issued January 25, 1922]

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## THE REDDISH EGRETS OF CAMERON COUNTY, TEXAS

By J. R. PEMBERTON

WITH NINE PHOTOS

**D**URING the month of May, 1921, I had an ever-to-be-remembered outing in the region between Brownsville and Point Isabel, Cameron County, Texas.

The avifauna of this region is exceedingly interesting because of the presence of numerous species whose centers of distribution lie in Mexico. Austin Paul Smith in the Condor for May-June, 1910, gave an excellent description of the land birds but neglected to fulfill a promise of a later paper on the water birds. I found the water birds to be fully as interesting as the land birds.

The Mexican fishermen of Point Isabel upon learning that I was interested in bird life told me that I should visit Green Island, which they said was a breeding ground for all the species of water birds found thereabouts. They got me so excited that on May 9 I hired two of them to take me in their boat to the island. In pitch black darkness about three in the morning we started, with a good fast boat, a brisk fair wind, plenty of provisions and water. During the five hours it took to make the thirty miles to the island the fishermen told me many interesting facts concerning the region.

Green Island lies about thirty miles north along the coast from Point Isabel, the latter town being just north of the mouth of the Rio Grande River. The Gulf of Mexico proper is shut off from the mainland by a sand bar which parallels the coast for hundreds of miles, in fact from Vera Cruz to near Galveston. This sand bar lies from three to ten miles from the coast, the bar being nearly straight but the distance from the coast varying because of irregularities in the coast line. The mainland is extremely low in elevation, scarcely over 25 feet, and the sand bar likewise. Consequently there are spots within the Laguna de Madre, as the enclosed bay is called, from which neither the mainland nor the sand bar can be seen, and in sailing up this Laguna we were nearly always out of sight of one of the two sides. Imagine my surprise therefore when I learned, first from the fishermen and then by actual test with a stick, that the depth of the water varied from one to three feet over the entire area. This great shallow Laguna is literally alive with fish and thus a source of food for the great throngs of fish-eating birds which inhabit it. My guides demonstrated what can be done with a small hand cast net by simply throwing it at

random into the water. After a few casts we had enough mullet to feed us a week.

During the sail, as soon as daylight arrived, small flocks of terns were constantly in view. I noted eight species in half an hour. The Royal (*Sterna maxima*), Caspian (*Sterna caspia*) and Cabot (*Sterna sandvicensis acuflavida*), with their loud, raucous, and slowly repeated cries, were the most prominent. The Caspians did not mingle with the others, although the Royals and Cabots were nearly always together. The Gull-billed (*Gelochelidon nilotica*) and the Common (*Sterna hirundo*) traveled separately in smaller flocks which were loosely bound together. The flocks were constantly growing smaller as individuals dove into the water after fish and henceforth traveled alone. Black (*Hydrochelidon nigra surinamensis*) and Least Terns (*Sterna antillarum*) traveled in very loose flocks



Fig. 1. REDDISH EGRETS AT HOME. THE LEFT-CENTRAL BIRD HAS JUST FINISHED THE NUP-TIAL DISPLAY. THIS GIVES AN EXCELLENT IDEA ALSO OF THE IMPENETRABLE FRONT PRE-SENTED BY THE BISBIRINDA.

and were rather aimless, constantly changing direction of flight and often beating back. A few Forster Terns (*Sterna forsteri*) were noted and more may have passed, for they are hard to distinguish from the Common unless the beaks are plainly seen. Laughing Gulls (*Larus atricilla*) were not as numerous as any of the terns. Black Skimmers (*Rhynchops nigra*) sat in solid companies on sand bars and black Mexican Cormorants (*Phalacrocorax mexicanus*) swept by in long streamers, low over the water. Brown Pelicans (*Pelecanus occidentalis*) were seen swimming and fishing both near shore and far out in the Laguna. Many unidentifiable sandpipers could be seen with the glasses along both shores when we approached near.

About seven o'clock Merced told me that Green Island was now visible and when he pointed it out to me I saw it, too, but it was a mere discoloration on the horizon. As we skimmed along in the fast little boat the discoloration changed into the island and we were finally near enough to see detail. It appeared to be a turret-shaped island of about thirty acres, and quite covered with thick brush. Surrounding it was a wide beach, on parts of which grew salt grass. Herons were standing in the water, resting on the tops of the brush, and flying leisurely about, but even as we landed none flew out to meet us. No birds

other than herons could be seen and I was disappointed, for I had been expecting to find here the breeding grounds for all the terns, gulls, skimmers, pelicans, cormorants and others. However, the herons made up in numbers for the lack of those species.

We made a camp on the sheltered side of the island and I started for a walk to encircle it. As I walked, the birds watched me casually and flew from their perches or from the shallow water surrounding the island as I approached too closely. In a few minutes I saw that Reddish Egrets (*Dichromanassa rufescens*) formed the major part of the avian inhabitants of the place. They were on all sides of me all the time. Some standing on tops of bushes peered at me, some peered from the shallow water, while some squawked at me from the air. Louisiana Herons (*Hydranassa tricolor ruficollis*), by far the neatest in appearance and most active, were next in abundance. They mixed quite informally with the Egrets excepting when fishing, and then they kept to themselves. Black-crowned Night Herons (*Nycticorax nycticorax naevius*) in full breeding plumage, extremely wary, left their perches abruptly as they caught sight of me, and flew into the interior of the island. Ward Herons (*Ardea herodias wardi*),



Fig. 2. THE REDDISH EGRETS HAD A LOT OF BALANCING TO DO WHEN THEY LIT ON THE BISBIRINDA, FOR THEIR FEET ARE EVIDENTLY TENDER.

appearing unduly large in size, were few in number and seen as individuals only, usually on the wing high in air. A fair number of pure white herons associated with the Reddish Egrets and were afterwards found to be Egrets in the white phase.

After a complete circuit of the island I essayed to enter the brush and get a more intimate acquaintance with these birds. Here I got a severe surprise for it practically could not be done. The brush consisted of straggling mes-

quite, Spanish dagger in abundance, several species of cacti, an *Opuntia* being the most abundant, and last but not least a bush which combined the sharpness of the Spanish dagger, the toughness of manzanita, and the wickedness of barbed wire entanglements. Over There, which was dignified by the name of Bisbirinda. A sweet name! I know not the botanical name of this demon and never intend asking it for I already know far too much about that plant. Summarizing—the island was difficult to explore! I returned to the Mexicans and had a session with them, and they smoothed the troubled waters with a word. In the olden days this island was known as a Treasure Island and treasure seekers had cut fine picadas across it in many strategic places. This was different. Treasure hunters thus have their usefulness and often benefit mankind.

I ascended a gentle incline until I stood on the upper level which must have been about twenty feet above the water's surface. As I raised from a crouch I could see over practically the entire thicket and the view was simply astounding. It was literally alive with Egrets, simply thousands of them. Louisiana Herons were loosely associating with the Egrets while the Night Herons were grouped together in a restricted area in which there were no Egrets. The Ward Herons were standing far separated from each other and soon after they first saw me they all left the island. Some of the white birds were quite close to me and I saw that they were Reddish Egrets in the white phase. The violet colored flesh about the face and the legs, together with the size and shape, identified them at once.

As to nests, every individual bush appeared to have nests on and in it. Some extremely large nests were evidently those of the Ward Heron, the most numerous were probably those of the Reddish Egret, while the smallest must have been those of the Louisiana Heron. Those of the Night Heron could not be determined upon. As I slowly made my way along the picadas the fact grew on me that none of the nests contained eggs. The birds were all in full breeding plumage, no young birds were in evidence, and some birds had already been seen carrying sticks to old nests.

In watching the Reddish Egrets many were then seen to be building nests. The greater part of the material consisted of dry salt grass stems, which was



Fig. 3. REDDISH EGRET, WITH NEST MATERIAL, HAVING TROUBLE WITH THE BISBIRINDA.



placed as lining in old nests, but once in a while a bird carried a dead thorny twig found beneath a mesquite. Frequently a bird with a stick in its bill came close to me, and apparently utterly oblivious of my presence, placed the stick in a nest, moved it about for a moment or so and then flew away.

Mating had not been completed as yet and many nuptial displays were seen. The male would alight close beside the female and erect or ruffle out all the feathers of the entire body, with the possible exception of those of the abdomen, and spread them to the utmost. The long plumes of the back, neck and breast fluffed out and made the birds look as large as turkeys. During this display the body was usually hunched, the neck drawn in with the bill pointed upward at a steep angle. It lasted but a moment and try as I might I did not get a

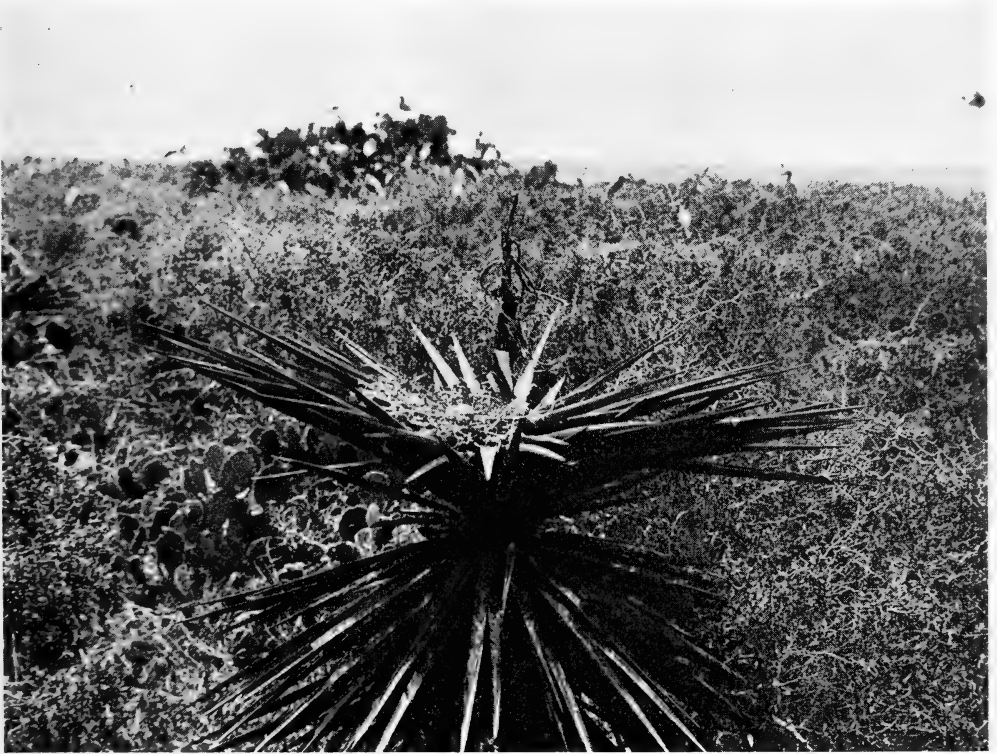


Fig. 4. NEST AND EGGS OF THE REDDISH EGRET.

photograph of the performance at its height. The female probably indulges also when she feels that she has acquired a mate, for two birds side by side were seen to go through the performance. Once an Egret in the white phase was seen performing before an Egret normally plumaged. Several mixed pairs of birds were noted and watched for some time to see if they stayed close to each other as if paired. I think that this ruffling of the plumage is indulged in as often as a demonstration by one male to another as for effect on a female. Thus when one male alighted near another frequently both birds ruffled their plumages before the newcomer became entirely settled.

Actual copulation was observed many times in the Reddish Egret. The male lit from the air on the back of the female who would be resting in her nest

looking pensively downward. The feet of the male were placed squarely on the back of the female. During the operation, the male of course squatting, the same erecting of plumage as in the nuptial display occurred. Many attempts were failures for the reason that if the female happened to be standing the male would disturb the equilibrium of the two when he lit on her back, especially if a gust of wind hit them just right.

The Reddish Egret in flight, is, I believe, more graceful than any other heron I have seen. The wing area must be larger in proportion to the size of the bird than in other herons, for there are moments when the bird handles itself after the manner of the vultures and albatrosses. Its flight is graceful, effortless and quite rapid. I found that near the end of the day the birds were entirely oblivious to man's presence. In this they resembled chickens on a roost very much. During the middle of the day they were more wary than at any other time. At any time, however, I found them to be easily frightened by the



Fig. 5. A MIXED PAIR. THE REDDISH EGRET IN WHITE PHASE WAS JUDGED TO BE THE MALE, FOR IT HAD JUST GONE THROUGH THE NUP-TIAL DISPLAY TO THE NORMALLY PLUMAGED BIRD. THE TWO BIRDS ARE STAND-ING IN A NEST.

noise of the focal plane shutter of my camera. Waving of arms or shouting even in mid-day would get the undivided attention of every bird, but they would not fly. But every time the shutter dropped every bird within range would up into the air.

We slept on the island. Just before darkness the Egrets left for the main-land or some place in that direction. They formed a steady stream for half an hour. Near the end of their flight the Louisiana Herons began to leave and when it was quite dark the Night Herons could be heard squawking as they too left. During the night very little noise prevailed; I did not sleep well and noted this.

Our return to Point Isabel next morning was uneventful. Upon reaching Brownsville in a few days I talked with Mr. R. D. Camp, the State and Federal Game Warden for that district and also a veteran ornithologist, regarding Green

Island. He told me that on June 6 of the previous year he had visited it in company with Mr. T. Gilbert Pearson, with the idea of making the island a Federal Game Reserve, and that on that date all the species nesting there had practically finished breeding. This indicated that the 1921 season was a late one. Mr. Camp had not seen the Egrets during the beginning of the nesting season so he agreed to revisit the Island with me later in the month. Mr. A. J. Kirn came down from Oklahoma to join me and the three of us made the next trip, which was on May 26 and 27.

We arrived late in the afternoon, too late to make any systematic investigations, but a short walk into the brush showed me that a great change had taken place since the 10th, for now nesting was in full swing and nearly every nest contained eggs.



Fig. 6. A PAIR OF REDDISH EGRETS IN FULL BREEDING PLUMAGE. THE MALE, BIRD TO RIGHT, HAS JUST FINISHED THE NUPTIAL DISPLAY.

When the birds began to leave the island for their nightly fishing we made a count every few minutes of the number of Egrets passing during one minute. The start and finish of the flight was of course taken. The figures we got were as follows:

Flight began at 7:30; 7:40 to 7:41 we counted 63; 7:45 to 7:46 we counted 84; 7:48 to 7:49 we counted 10; 7:49 to 7:50 we counted 49; 7:55 to 7:56 we counted 39; 8:00, too dark to count, flight over.

By interpolating for minutes not counted these figures show that 1500 birds passed over us. All of these birds, Egrets only, were assumed to be males, the females remaining on the nests in probably equal numbers. Doubtless many males did not leave the island with the main flight and also others left from

other parts of the island. We agreed that 3000 would be the minimum number that could be placed on the Egrets.

During the middle of the day great flocks of Egrets stood in the shallow water at the north end of the island. Mr. Camp counted 1200 there next day. If these were all mates of sitting birds, double the number of Egrets must be present. At the other end of the island at the same time there was a large flock which was estimated to have 500 birds in it. These figures would allow an estimate of 3400 birds for the Reddish Egret population. We three agreed that many more might be present and we settled on a figure of 4000. We estimated the Louisiana Heron population at 2000, the Black-crowned Night Heron at about 100, and the Ward Heron at 50. Mr. Camp saw one Great White Heron (*Ardea occidentalis*).

The next day we were up early and commenced a careful examination of



Fig. 7. THIS REDDISH EGRET HAS JUST FINISHED THE NUPTIAL DISPLAY. THE SUPPOSED FEMALE IS DIRECTLY BEHIND HIM AND THE HEAD AND NECK OF A RIVAL MALE APPEAR TO THE RIGHT.

the nesting habits of the herons. We found the Egret nests to contain from one to four eggs, with three the normal complete set. About half the nests contained two eggs and very few contained four. Nearly all the nests were on top of either the bisbirinda or the Spanish dagger. The mesquites had very few, although some of the stunted and more robust carried nests. The Louisiana Heron built its nest usually on the side or midway up in the bushes, and rarely on top of anything. Many bushes had several nests in them and usually of both species. Three eggs constituted a full clutch. Although a few nests were found containing four eggs, the shape of the eggs in some of these made us think that two females had layed in the nest. Ward Heron nests contained from two to three eggs, and incubation had progressed farther with this species than with

any of the others. Nests of the Night Heron were hard to find, but evidently they were lagging behind the other species and had not commenced egg laying.

We had been in the brush only a short time when we began to notice numbers of freshly broken eggs lying in the nests. By looking for them we soon found that there was a tremendous number. They occurred in nests of all the three species which had eggs. It looked as if the birds on leaving their nests on our approach were breaking their own eggs. For some time we were perturbed at this state of affairs and determined to actually see a bird break its eggs. Birds sitting on eggs were approached, but as the bird left she never broke any eggs. Finally we discovered that it was the work of the Grackles (*Megascopus major macrourus*). Each of us separately saw these birds pounce into nests and pick holes in the eggs. In most cases the contents ran down through the nest and was wasted on the ground, but the Grackle always managed to get a few mouthfuls before the egg went dry. It looked as if a Grackle would have to break a great number of eggs before it would get a full meal. I saw Egrets drive the Grackles away from their nests frequently, so they are wise



Fig. 8. LOUISIANA HERON AND REDDISH EGRET, SHOWING COMPARATIVE SIZE.

to their sole enemy. There were probably one hundred pairs of Grackles on the island and the damage done by this number must be very great. The Grackles build their nests in the same bushes with the Egrets and on that day many nests contained eggs. We smashed all we could find. Mr. Camp planned to return to the island later with the object of determining if the Grackles ate the newly hatched young, but was unable to do so.

Another remarkable thing about this island is that coyotes visit it, though it is about five miles from the mainland and more than that from Padre Island, the sand-bar. Their dung, tracks, and dens, and skeletons of partially eaten herons were all unmistakable evidence. No fresh water exists on the island so it is improbable that the coyotes can remain very long. The fruit of some of the cacti, dew and possibly other sources would supply the water wants on a short visit. Coyotes certainly can not see this island from the sand-bar. The Mexicans say that it is there that they come from. In times of great north winds the water is reputed to be blown out of the Laguna and on such an occasion a coyote might find the island as he ventured out on the mud flats for dead fish. We found that the Louisiana Heron is the principal victim of

the coyote, for there were a great many more carcasses of this species than of any other. None at all were found of either Ward or Night herons.

The Reddish Egret is a silent race, the only note being the squawk, which is far less forcible than that of the Night Heron. As the birds leave on their nightly fishing expedition they squawk more than at any other time. As they sit about their nests there is some snapping of beaks at intruders, Grackles, and even their mates.

Mr. Pearson, when visiting Green Island with Mr. Camp, stated that this colony is the largest in existence in the United States. He had seen all the others. I understand from Mr. Camp that arrangements have been completed for the turning of the island into a Federal Reserve. A warden will be placed on the island during the breeding season and he will poison, shoot and in other ways get rid of the Grackles and coyotes. Thus this fine colony will be permanently preserved.

Few land birds live on Green Island. Curve-billed Thrashers (*Toxostoma*



FIG. 9. THE GRACEFUL FLIGHT OF THE REDDISH EGRET.

*curvirostre curvirostre*) occur in small numbers. Mr. Camp found the nest with a set of four fresh eggs of the Texas Woodpecker (*Dryobates scalaris bairdi*) but this bird could hardly be expected to regularly nest on the island. Mr. Kirn found a nest with two fresh eggs of the Black Vulture (*Catharista urubu*) on the ground beneath a canopy of cactus (*Opuntia*) leaves. One family of Gray-tailed Cardinals (*Cardinalis cardinalis canicaudus*) was found.

One of the last happenings before we left the island was the arrival of a flock of about fifty Roseate Spoonbills (*Ajaia ajaia*). They settled in the shallow water on the north end of the island and at once began probing in the mud with their spatulate bills. They were too wary to permit an approach with a camera and flew away after only a short feed.

All the illustrations accompanying this article are from photographs taken by the writer at Green Island.

Tulsa, Oklahoma, November 21, 1921.

## MAGPIES VERSUS LIVESTOCK: AN UNFORTUNATE NEW CHAPTER IN AVIAN DEPREDACTIONS

By S. STILLMAN BERRY

WITH TWO PHOTOS

WHEN civilized man extends his domain into an hitherto unoccupied region, as he has done in the case of much of the territory of our western states during the last half century, one of the first results of the impact is an inevitable severe dislocation of the whole nice dynamic equilibrium existing in the life relations of the myriad of humbler animals and plants endemic in the area. Some of these, unable to meet the new conditions involved in the introduction of so all-invading a competing or conflicting organism as man, never recover from their first reverses and sink rapidly into extinction. Others linger on, continuing a losing battle in the face of ultimate defeat until perhaps man himself rouses in interested admiration to temper the odds against them. Still others are able to maintain themselves in the old way without much discomposure, while a fourth class meet the invader half way and by divers quaint counter-adaptations to the human environment attain such powers of survival as to hold their own willy-nilly, the pleasure of omnipotent man in large degree to the contrary notwithstanding. The detection, observance, and recording of these secondarily acquired adaptive habits form by no means the least profitable field open for investigation by the biologist in any new country. In the older regions, it is true, these changes still present themselves at intervals, but no doubt less frequently, and the complete history of the transformation in any given case is generally more difficult to trace.

Viewed in this light the few observations here recorded possess a somewhat wider significance than the mere recognition, in the economic sense, of "another pest", although whether the modifications of habit noted will ever become permanently established or sufficiently widespread to be considered a specific part of "picine" ecology, only the future will reveal.

It is well known that magpies, like their relatives, the jays, habitually devour, not only coarse seeds, berries, and insects of many species, but also small mammals, the eggs of other birds, and all too often, alas, the young birds themselves. Likewise they are and doubtless long have been energetic scavengers demolishing carrion with a speed and assiduity that their human observers can scarcely envy. Yet we do not generally think of them as raptorial in habit, at least in any major sense, and to find them becoming so tempers our natural indignation at their bloodthirstiness with surprise at their ready aptitude in learning to adapt themselves thus readily to so new a source of food. The frequenting of the backs of animals, especially the various ungulates, by magpies and other birds has ever been a commonplace observation, but while the knowledge that magpies may resort to such situations for the purpose of preying directly on the animals themselves has been the little treasured property of western stockmen for some time, little seems to have found its way into print regarding the birds' assumption of so malevolent a habit.

It was in July, 1912, that the writer had his first experience with an attack by magpies (*Pica pica hudsonia*) upon one of the larger mammals, in this in-



stance sheep. The occurrence was reported verbally a few months later to Drs. W. K. and A. K. Fisher, who stated that such behaviour on the part of these dashing denizens of the air was wholly new to their experience, and accordingly urged that the observation be placed on record in one of the ornithological journals. However, in the press of other circumstances and likewise the expectation that further data on the subject would come to hand, such notes as I had were laid to one side. I have jotted down a few additional observations from time to time since. The recent appearance of a very brief but valuable note on the subject by A. W. Schorger (*Auk*, vol. 38, 1921, pp. 276-277) impels me to add what information I can while the interest aroused by Schorger's note is still warm. The present paper covers observations made during a decade of summers spent at Winnecook, Wheatland County, Montana. It doubtless fairly summarizes the actual experience of almost any cattle and sheep ranch in central Montana where the magpie is one of the most abundant and ubiquitous of birds, whether on the open prairie or among the woods and pastures of the river bottoms.



Fig. 10. MAGPIE IN CHARACTERISTIC ATTITUDE ON BACK OF RAM IN PASTURE. PHOTOGRAPH TAKEN BY ELWYN H. DOLE AT WINNECOOK, MONTANA.

The depredations committed by the saucy black and white beauties in 1912 were of a very serious nature. It is the custom in many of the western ranches to bring the rams into a roomy bottom-land pasture after shearing, where they remain fenced in, usually without the constant care of a herder, through the summer. Magpies abound in just such localities as those generally chosen for the "buck pasture", the isolation of which gives them a better opening for any deviltry to which they may be inclined than is afforded by the sheep bands out on the prairie with their herders always watching over them. Now ordinarily the abundant wool of the range sheep is an ample protection against even so powerful a weapon as a magpie's bill, but in July a Montana sheep has just been deprived of this padded armor by the June shearing and is as defenceless as a kitten. Not only that, but the chances are that a cut of the shears here or there opens up a tempting display of raw, juicy flesh,—just a nice little tidbit to bait a meat-loving magpie. During that summer a number of magpies began bothering the newly shorn rams, *beginning*, as I believe is usually the case, contrary to the experience of Schorger's correspondent, on

those showing particularly bad shearing cuts. As soon as this was discovered the birds were driven away and I believe a few of them shot as a warning, but they soon returned to the attack, and before the seriousness of the situation was realized they had opened up ugly wounds on quite a number of the sheep, from which they would pick and tear the flesh whenever the least chance was allowed them. The sheep seem utterly helpless in such circumstances, merely lying or standing pitifully while their tormentors, alighting on their backs and clinging there, give the wounds no chance to heal. Blow-flies soon add their quota to the troubles of the poor quadrupeds and a wound of this sort cannot long go unattended before it becomes a writhing mass of maggots. What made matters worse during the year in question was that soon the magpies, or some of them, began, by dint of their own efforts, to open up entirely new wounds on the sheep. For some reason the kidneys are particularly favored tidbits, and the birds were quick to learn the location of these organs in the animal's body and the ease with which they could penetrate to them by drill-



Fig. 11. A ROMNELET RAM VICTIMIZED BY MAGPIES, SHOWING TYPICAL LESION IN RENAL REGION IN PROCESS OF HEALING. PHOTOGRAPH BY THE AUTHOR AT WINNECOOK, MONTANA, AUGUST 28, 1921.

ing a shallow hole just at the side of the spine in the lumbar region. Through this they would peck away piecemeal, first the overlying tissues, then the toothsome fatty layer, and then work into the kidney itself. The wretched sheep would become weaker and weaker, soon sink by the wayside, and in the absence of prompt human intervention the end was not long delayed. In fact if the magpies had gained very much headway before being discovered, even human help was of small avail. As mentioned by Schorger the Kea of New Zealand has long been known to prey at times upon living sheep. It is of interest to note that it, too, has been reported to have a particular predilection for the region of the kidneys, where its appetite is said to be for the fat surrounding these organs. So far as I could ascertain the magpies were not content with the fatty layer, but ate the true glandular tissue as well. Newton states in the *Encyclopaedia Britannica* (11th Edit.) that "The amount of injury the kea inflicts on flockmasters has doubtless been much exaggerated, for Dr. Menzies states that on one 'run', where the loss was unusually large, the proportion

of sheep attacked was about one in three hundred, and that those pasturing below the elevation of 2000 ft. are seldom disturbed." When once fairly started a flock of pies is capable of doing much worse damage than this. I still have a photograph of the 1912 hospital band at Winnecook which shows about 15 rams all suffering simultaneously from injuries of this nature. As the total number of rams on this ranch at that time was certainly under 350, this gives a percentage of animals attacked of better than 4 percent. As a result several valuable rams were lost entirely in spite of all that could be done by means of remedial measures applied directly to the wounds, and protection from further magpie attacks, together with an active war of destruction against the birds. The latter failed to diminish the total number of pies very much, but must have been successful in eliminating most of the more guilty ones, for I have no record of much trouble of such virulent nature during the seasons following. There have been, however, a few scattered instances, now and then, for which I believe there is some reason to think that certain individual birds were chiefly responsible. One bad case of a ram victimized by magpies occurred at Winnecook during the past summer, and was made the subject of the accompanying photograph. The attack took place in the buck pasture as usual, and a serious wound had been opened over the right kidney before the animal's condition was discovered. In this instance it was not too late to effect complete cure, however.

Whether in earlier times magpies ever made a practice of preying in this manner upon wild quadrupeds is doubtful. No such case has ever come to the notice of the present writer and as none of the "old timers" with whom the matter has been discussed seem to recall anything definite about stock losses from magpies in the early days, it seems reasonable to suppose that attacks on living ungulates have been undertaken only quite recently. This perhaps constitutes an explanation why this habit is still more or less a sporadic one, and why some magpie individuals or colonies are so much more prone to practice it than others seem to be. The individual experience of any given bird is evidently an important consideration or even the ruling one, but there seems little doubt that the addiction is one easily acquired by almost any of them when circumstances favor it.

The manner in which such a habit might be formed is not difficult to imagine. In fact it might take place in any one of several readily occurring ways. As has already been mentioned magpies are commonly observed to frequent the vicinity of many of the larger domestic animals, frequently alighting on their backs and pecking about there. Also we have frequently noticed that they will gather about a weak sheep or young lamb unable to defend itself and peck at its eyes. Or, when there are cuts or sore places on the backs of animals (in our local experience principally cows), a magpie is almost sure to alight on the victim and peck away at the exposed flesh. So it is all too easy to pass from this discovery to that of the shearers' cuts on the sheep as already noted, or the tender brands on newly branded cattle. But from whatever point of vantage the signpost pointing the final descent down the path of depravity is all too plain, and the birds find the transition to making the initial wound themselves an easy one.

On this same ranch not long since the cowboys reported two cases where the magpies in attacking freshly branded cattle penetrated well into the body

cavity. One of these animals was nearly dead when found, and my recollection is that the other case had a fatal termination also.

Another instance of magpie depredation occurred in the winter of 1919 when a half dozen hogs caught in a blizzard at some distance from the farmyard gave up fighting the storm, and lay down together as such animals so frequently will. In that situation they were set upon by magpies and when found the birds had picked through the skin of the back and eaten into the flesh of every one of the six, though some were in much worse condition than others.

Mr. Schorger's correspondent in Utah (*op. cit.*, p. 276) reported that in his experience "the wounds were always in the back, the magpie sitting there and pecking until it had opened up a small hole in the flesh." This position is of course the natural and convenient one for the bird to assume, but much depends upon the presence on the sheep or other animal of previous wounds and their location. The cattle brands referred to as sometimes subject to molestation happen to be on the sides of the animals.

From the foregoing it may readily be seen that it would not require a very great extension of the habit for magpies to become a truly serious menace to livestock and the industry founded thereon. At any rate the possibility of this is worthy of consideration—*before* the event, rather than *after*. But as indications on the hopeful side of the situation may properly be emphasized,

(1) The possibility that the habit is one acquired only occasionally and by certain birds, so that the destruction of these particular individuals will suffice for protection on the part of the stockman until such time as another colony may take a notion to start the same thing over again.

(2) The chance that in any case the habit will always remain, as it would seem to be at present, sporadic.

In conclusion the writer ventures to add that he is not an ornithologist or well acquainted with the ornithological literature. Consequently it is wholly possible that magpie misbehaviour of the nature noted may already have received attention in print somewhere in addition to the note by Schorger, the only one on the subject which he has chanced to see. Any information respecting the existence of earlier records, or in the way of new field observations by others, would be greatly appreciated by him.

*Redlands, California, November 21, 1921.*

## NOTES ON THE DIPPER IN YELLOWSTONE NATIONAL PARK

By M. P. SKINNER, Park Naturalist

THE little, dark, almost black Dipper (*Cinclus mexicanus unicolor*) is resident along almost every stream in the Park from the lowest elevation (5300 feet) well up above the 8000 foot level. I doubt not but that Dippers would be found much higher if there was any place for their beloved streams to descend from. Seen to some extent about ponds and lakes, they much prefer rapids, although not the most tumultuous ones, and waterfalls; and they are common enough along the mineralized waters. Only once have I seen one away from water and then he was flying over the quarter mile stretch between two streams. I have seen them on streams not more than two feet wide in the fir forests; along ditches, if the water be but clear and running; and occasionally, in November, along a ditch watering a barn yard. They live about beaver ponds, and at least one pair has a scenic retreat in the depths of the Yellowstone Canyon at the foot of the Lower Falls.

Usually alighting on a stone along shore or in mid-stream, they are not averse to resting on a stump, on drift caught in the current, or on a snag or root extending out over the water; but the farthest from the water I have ever seen one perched, was on the edge of a concrete retaining wall six feet above the water. In winter they are given to perching on the edge of the ice along shore, or about an opening, where they never seem to slip even when the ice is fresh and "as slippery as glass." Sometimes they fly up along the power pipe line to the reservoir and rest on the edge of the ice by the open water that never quite closes even in the coldest, below-zero weather. In winter, Dippers are on the formation below Jupiter Terrace, and they live all winter long as high as 8000 feet above sea level wherever the hot springs keep the streams open, such as the Gardiner, Gibbon, and Firehole rivers, Alum Creek, and in the Geyser Basins.

The Dipper is given to "dipping", quite like a sandpiper, while standing on any convenient stone, or ridge on the ice. Often running nimbly along the level shore ice, he is very active and always busy except when he stops a few minutes to sing, or to take a sun-bath. On early winter mornings, sun-baths are the regular thing. One cloudy morning I noted a Dipper do the next best thing—warm himself and bask luxuriously in the steam from some cooled geyser water that was still much warmer than the keen, wintry air. While swimming on the water, a Dipper goes along nodding his head quite like a miniature rail, or a coot. In many ways Dippers suggest wrens. They are small and quick; they often perk up their short tails at a steep angle; and they are forever exploring every nook and cranny of their domain.

More or less solitary, never more than a pair together, except for a family party just from the nest, they do not associate with other species. Each bird, or pair of birds, claims a portion of their stream as their own, and promptly drive off intruding Dippers and then as quickly return to their own home section. Once I saw the intruder halt in mid-air and dive like a flash into the rapids two feet below him to escape. True, winter necessities make it rather crowded along the few open streams; but even if sections are smaller then, they are still preserved inviolate.

The flight is direct and the wing beats are very rapid for a hundred feet,

then the Dipper coasts along ten feet with the acquired momentum before taking up his wing strokes again. Except for the quarter mile flight already recorded, I have seldom seen a Dipper over land; indeed, this bird is noted for the fidelity with which he follows the waterways. A bird will come flying down one stream, turn an acute angle at the mouth of a second stream, and then go buzzing merrily up it after flying three times as far rather than cross the neck of land between the two streams. In following an irrigation ditch, one will turn at a right-angle promptly with the ditch. A pair that fly up along the power pen-stock to our reservoir come the nearest to flying regularly over land of any that I know of. Sometimes in chase and pursuit, the rule is forgotten until the excited birds find themselves over the unfamiliar dry surface.

Usually a Dipper flies close to the water, but I have seen one flying along thirty feet above the surface. When ready to alight he chooses either the shore or the water surface, although I believe he prefers to alight on a running stream and swim ashore! In the case of still water, he certainly prefers alighting on the surface. It appears easy for him to take flight again from the water.

The song is a loud, clear, bell-like strain, the very essence of happiness and joy, ringing out high above the rush and roar of all but the heaviest of rapids. Still sweeter by far is it when heard in the depth of winter. Although rapids may sometimes dim the music, often there is a ringing echo from the cliffs to reinforce it. Beginning about November first, the song season reaches its height in February and March. I have heard the Dipper sing on clear, sunshiny days when the temperature was down below zero; I thought it anything but spring-like, yet these musicians sang cheerily in spite of thermometer readings. Usually squatting on a stone out in the stream, where errant drops of water often dash over them, with head and neck slightly outstretched, they are very still and quiet while singing, except for occasionally turning their heads, and "winking". Their stone platforms are from three to ten inches above the water, and the motionless singers are hard to see. They do not dip while actually singing, but often do during the pauses in the song. Sometimes they sing while in flight, and occasionally I have heard a song from a bird running along shore. At times I have seen a Dipper diving one instant and the next he was in full song, only to resume diving and feeding shortly after. While Dippers prefer to sing on warm, spring days they frequently sing also on zero days, and often the clear notes ring out during the severest of snow storms. Once I found one singing a merry lay in a heavy snow driven by a high wind that I did not at all care to face myself!

An angry, hissing note used when chasing off intruders is so distinctive as to point out the bird at once; such a striking sound attracts attention the instant it is heard.

Dippers run along the shore ice, swim in, as well as on, the water, and dive in "all over" as they please even when the thermometer is far below zero. With feathers oiled against wetting, a bird under water is easily seen because of the silver air bubbles adhering to the plumage. They sing, play, and dive during cold, north winds that drive even the hardy Nutcrackers to cover. Dippers are unaffected by cold, remaining along the upper Yellowstone during November and even later, the very quintessence of hardihood!

Properly speaking, they do not migrate, but the freezing of some of the

Park streams forces them to congregate along those still open. In this way, they begin increasing along the lower six miles of the Gardiner River that is open, about November first, and by Christmas this section supports a population of seventy-five Dippers as against the summer quota of perhaps ten. In the spring, usually towards the middle of March, they begin moving up as rapidly as the streams open again.

Food is secured under water by diving, even through "anchor ice" on the surface and "slush ice" in the water; sometimes a Dipper stands in shallow water and gleans from the bottom without diving; and once or twice I have found one apparently skimming his food from the surface of the pool over which he was swimming. Diving from the shore ice quite like human divers, from the surface of still water, they leap forward and down, only to reappear after a minute or two with the sudden uprush of a cork. Water only slightly roily does not seem to bother them in the least and our clear mountain streams are not often worse than that. Occasionally the birds combine singing and eating, as already related in the paragraph under song.

After a hearty breakfast, a Dipper usually comes out to bask and preen in the early morning sunlight. In fact, these little birds are given to sunbaths; they are often seen perched silently on a stone, so quietly as to simulate sleep except that their heads are not "under their wings" and the winking white eye-lid is easily seen.

A bird almost continually in the water and the rest of the time in the spray of rushing rapids and waterfalls, one would not think in need of a bath. But the Dipper thinks otherwise, and when he bathes, he does it thoroughly. The first bather I found was standing on a stone in mid-stream, alert, and with tail perked up straight. Then he flew, hit the water three feet away, and shot along the surface with head under so that the water rushed up over his back; then he flew away, and came back again immediately for another plunge. After that, he stood in shallow water covering legs and half his body, and fluttered in approved bird-bath fashion; then to a stone to shake himself, to dress his feathers, and to preen.

I am doubtful whether Dippers mate anew each year, and I am inclined to believe in "mating for life" for this bird. They seem to have all paired early. On a few occasions, I have seen male Dippers singing very sweetly and very earnestly with tail perked up at an extravagant angle and wings slightly drooped, again very much like a wren. Probably these were birds not supplied with a mate from the previous year.

When there is a suitable rafter low and moist enough, Dippers sometimes nest under bridges, but a niche in a boulder in mid-stream is much more likely to be selected. Once, on March first, a couple was seen building a nest in a boulder niche along the Gardiner River. The nest was a ball of moss about nine inches in diameter with a little mud inside, and mud was also used to cement the whole to the rock. Four feet above the rushing water, the nest faced north or downstream; as a rule the Dipper nests I have found have faced downstream. In the front of the nest ball was a round opening about one and a half inches in diameter, leading to the inner nest of coarse, wiry grass that did not wet down into a sodden mass. While this nest seemed to be completed, I found it still unoccupied two weeks later, although the birds were frequently in its immediate neighborhood. About March 24 this nest was torn



out by the birds and later rebuilt. A ball of green in July, this second nest even had new grass growing from it to a height of more than a foot. I am under the impression that three birds were brought to maturity from the four white eggs this nest contained. At any rate a full-fledged youngster was seen in the vicinity on July 3.

Another nest was on the bank of the Lamar River facing west over rippling water just below Rose Creek, and built into a hollow between two harder layers in the gravel. It was like the first, but had a unique location in that there were no falls nor rapids near, and consequently no spray to keep the moss green. A third nest was found April 20, on another boulder in the Gardiner, three feet above the water. It was similar in every way to the nest described except that the opening had a portion of the nest material projecting out, like a porch, over the entrance, the birds going in from below.

In the far western part of the Park, I located a nest, like the one described, placed two feet above the swiftly running water on a rock in the middle of Campanula Creek. It faced south, but as usual was on the downstream side. It was like the third nest in being entered from below, but the entrance was gourd-neck shape and made of mud. Four white eggs were being incubated on May 20, and the mother stuck so closely that she would not leave until I struck the outside of the nest ball. At the foot of an artificial waterfall near the Power Plant at Mammoth, was a nest similar to the first described, in the crotch of a dead log. However, this nest was on top of its support and not on the side.

One summer there was a Dipper's nest beside Rustic Falls near the heavily travelled Golden Gate road. It was about eight feet below the edge of the Falls and three feet to one side of the falling water. It was so totally inaccessible that I could not reach it, and so I learned little about it except that nestlings were being fed on July 4. It was located 7300 feet above sea level, whereas the lowest of the nests here described (one of those along the Gardiner River) was at 5400 feet elevation.

Apparently, as with other species, Dippers' nests are very characteristic in size, shape, material, and location, and can be identified at a glance. Still there are many modifications in minor particulars.

*Yellowstone Park, Wyoming, April 7, 1921.*

## SOME BIRDS OF ROOSEVELT LAKE, ARIZONA

By HARTLEY H. T. JACKSON

WITH MAP AND ONE PHOTO

THE NOTES on the birds of Roosevelt Lake, Arizona, here presented are intended only as supplementary to the interesting account by Swarth<sup>1</sup>, and include remarks only on those species found within the area actually covered by the lake proper and its immediate shore-line. The investigations were undertaken for the U. S. Biological Survey as a part of its general study of the land vertebrates of the state. Field work was conducted at the northern end of the lake May 19-24, 1916, although actual observations of the water birds were made mostly on May 20 and 22, and a trip was made by motor-launch to the bird colonies at the eastern end on May 26. Swarth visited the colonies of cormorants and herons on the lake early in June, 1917, a little more than a year after my observations were made; but the time he had available for study of the water birds was less than in my own case, and this in part probably accounts for the apparently greater number, both of individuals and species, indicated in my list. The counts of the breeding birds were made after I had become fairly well acquainted with the colonies, and I believe they are reasonably accurate. They are based on actual counts of adult birds, checked with counts of the nests.

Roosevelt Lake, which is formed by the damming of Salt River by Roosevelt Dam, is located near the geographical center of Arizona at an altitude of 2300 feet. It lies in a general southeasterly-northwesterly direction, is about thirty miles long and three miles wide in its widest part, and has a very irregular shoreline, particularly on the northern side. The lake is about 275 feet deep in the deepest parts, the supporting dam being 286 feet high. The water in this reservoir is supplied mainly by two streams, Salt River, which flows in from the east, and Tonto Creek, which flows in from the north, at opposite ends of the lake. The former banks of both Tonto Creek and Salt River were lined with cottonwoods (*Populus wislizeni*), and in the shallow water near the ends of the lake many of these trees, killed by the high water, have their tops left protruding from the surface of the lake, offering nesting sites for cormorants and herons. Farther up these streams, particularly up the Tonto, are dead small trees and bushes, and large live trees, the trunks of which are but little submerged, where other herons nest. Both of these streams carry quantities of debris and silt, and already a mud and sand flat has begun to form at each end of the lake, especially noticeable at the Tonto end. Salt River seems to carry more debris, such as timber, but less silt. The flat at the mouth of the Tonto covers an area of approximately four square miles. At present there is no marsh or perceptible amount of aquatic vegetation growing on these flats, but it is possible, though hardly probable, that ultimately such a type of vegetation may develop, adding increased nesting places for species of birds now unknown to breed on the lake. The variation in the water level, however, tends to prevent the growth of such vegetation. Except at the ex-

<sup>1</sup>Swarth, H. S., Birds of the Papago Saguaro National Monument and the neighboring region of Arizona, published by the National Park Service, Dept. of Interior, Washington, D. C., 1920.

treme ends of the lake and at two or three places along the northern side, the shores are steep and in many places almost precipitous.

The general topography in the vicinity of Roosevelt Lake is rough and broken. On the west side of the northern arm of the lake, where most of the field work was conducted, the soil covering is slight, the basal structure being largely a reddish limestone, inter-mixed with conglomerate and granite. Bumblebee Canyon drains the region of Mazatzal Range adjacent and just north of Four Peaks. This canyon is terraced much of its length through a gravel soil washed from the hills above. Underground water oozes to the surface in many places to form Bumblebee Creek, the actual stream being less than a mile long in dry weather. It was near the mouth of this creek that headquarters were made May 19 to 24.

The entire region adjacent to Roosevelt Lake lies in the Lower Sonoran Zone, which is here characterized by the growth of such plants as *Covillea glut-*

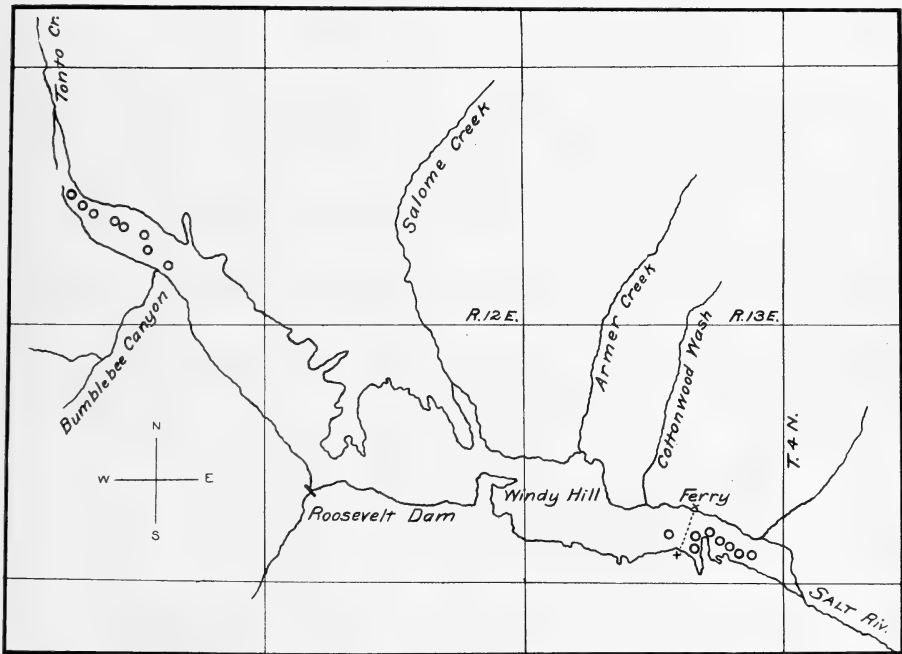


Fig. 12. MAP OF ROOSEVELT LAKE, ARIZONA. CIRCLES INDICATE APPROXIMATE LOCATIONS OF BREEDING COLONIES OF CORMORANTS AND HERONS.

*inosa*, *Prosopis glandulosa*, *Acacia greggi*, *Fouquieria splendens*, *Hymenoclea monogyra*, *Gutierrezia* sp., *Carnegie giganteum*, *Dasyllirion wheeleri*, *Yucca radiosa*, and *Chilopsis linearis*. The aspect is distinctly that of desert mountains.

**Phalacrocorax auritus albociliatus** Ridgway. Farallon Cormorant. This species was found breeding in dead cottonwoods, the tops of which protruded above water fifteen to forty feet deep. The nests were usually about fifteen to twenty feet above the water, never under twelve feet above the surface. The water, however, had receded about six feet during the nesting season. All the nests examined contained young from a week or ten days old, to birds well feathered and nearly able to leave the nest (the greatest part of the young were this age), and to a few able to fly and swim. All told, there were about 130 pairs of cormorants breeding on the lake, about 90 pairs at the Salt River end, and about 40 pairs at the Tonto Creek end. Swarth (*loc. cit.*, p. 52) estimated the number at the mouth of the Tonto as 40 or 50 birds.

Economically these birds may have some detrimental habits in tending to destroy fish planted in the lake. But the majority of the fish captured by them are the slow-moving German carp (*Cyprinus carpio*) and a few blue-gills (*Eupomis pallidus*), the principal game and food fish of the lake, the large-mouth black bass (*Micropterus salmoides*), probably being disturbed but little. Of three fish seen dropped by cormorants at the nesting colonies two were carp and one was a blue-gill.

**Chaulelasmus streperus** (Linnaeus). Gadwall. About a dozen Gadwalls were found at the Tonto end of the lake, where they were most frequently seen among the partly submerged brush or on the mud banks. The two specimens collected showed no signs of breeding activity either in habits or anatomically.

**Spatula clypeata** (Linnaeus). Shoveller. There appeared to be about ten Shovellers inhabiting the mud flats and brush at the Tonto end of the lake. The female taken had small undeveloped ovaries.



Fig. 13. NEST AND YOUNG OF PALLID GREAT BLUE HERON. TONTO END OF ROOSEVELT LAKE, ARIZONA.

**Erismatura jamaicensis** (Gmelin). Ruddy Duck. Ruddy Ducks were found only at the Tonto end of the lake where there were probably about twenty individuals. Three females which were collected each had small, undeveloped ovaries.

**Ardea herodias treganzai** Court. Pallid Great Blue Heron. The colonies of Great Blue Herons were somewhat scattered, being mostly at the Tonto end of the lake where about eighty pairs were nesting. Practically every nest examined contained young, which in most cases were nearly ready to leave. About forty pairs were found nesting at the Salt River end of the lake, May 26, making a total of about 120 pairs on the lake.

**Herodias egretta** (Gmelin). Egret. Two birds of this species, apparently a pair, were seen on several occasions on the mud flats at the mouth of Tonto Creek. At one time, after crawling for many yards through spiny desert vegetation, I succeeded in

approaching to within sixty yards of one of them. This was within chance range of my 20-gauge shotgun and, in fact, my gun was at my shoulder. But I did not pull the trigger, for here was one of the only two egrets on this bird sanctuary, possibly one of the only two in the state of Arizona, and they were probably breeding birds. These egrets, however, were exceedingly wary and usually remained well out on the mud flats where they were fairly safe.

*Nycticorax nycticorax naevius* (Boddaert). Black-crowned Night Heron. Swarth (*loc. cit.*, p. 54) considered the Black-crowned Night Heron less abundant on the lake than the Great Blue Heron, and reports seeing "perhaps 20 birds, all told." My own observations, as recorded directly from my field reports, are: "The most abundant, though probably the least conspicuous, bird on the lake, usually nesting in living cottonwoods partly submerged in the water on the flats. About 120 pairs nested at the Tonto end of the lake (May 20-24) and about 80 pairs (May 26) at the Salt River end. Young in most cases were able to leave the nests and perch on branches, or fly. Some ten nests were seen in dead trees, all others being in trees bearing green leaves."

*Fulica americana* Gmelin. Coot. There were between ninety and one hundred Mud-hens on the Tonto end of the lake, but not one was noted at the Salt River end. A male, collected May 20, had very small testes and apparently was not breeding.

*Actitis macularia* (Linnaeus). Spotted Sandpiper. A single individual of this species was seen on two occasions (May 20 and 22) on the shore near the mud flats at the Tonto end of the lake.

*Oxyechus vociferus* (Linnaeus). Killdeer. Some six or eight Killdeer were observed on the mud flats at the mouth of Tonto Creek, May 22.

*Pandion haliaëtus carolinensis* (Gmelin). Osprey. Ospreys were seen daily (May 19-29) near Roosevelt Lake, where a dozen or more birds obtained food.

*Aluco pratincola* (Bonaparte). Barn Owl. A Barn Owl was seen, May 20, perched peacefully among a colony of twenty-seven cormorant and eight great blue heron nests containing young, in the top of a dead cottonwood over thirty feet of water and 300 yards from the nearest shore. So far as I could observe, it had not disturbed the rookery in the least.

*Bubo virginianus pallescens* Stone. Western Horned Owl. A nest, containing two young fully one-third grown and able to perch on limbs of the tree near the nest, was located in the top of a partly dead cottonwood well out in the water at the Tonto end of the lake (May 20).

*U. S. Biological Survey, Washington, D. C., September 29, 1921.*

## FROM FIELD AND STUDY

**On the Occurrence of the Buffle-head at Eagle Lake.**—The notes under the above caption by Milton S. Ray in the November CONDOR require some comment. The bird in the first photograph is undoubtedly a female Buffle-head (*Charitonetta albeola*), the young ones following her are indefinite. The two downy young "Buffle-heads" in the other photograph (fig. 33) are obviously and emphatically American Mergansers (*Mergus americanus*), newly hatched. The markings on their heads together with the shape of their bills are both unmistakable, and quite unlike a downy Buffle-head.

Young ducks frequently follow an adult of another species. I have seen a female Buffle-head and a female Barrow Golden-eye both guarding a single duckling of the former species and both equally solicitous. At another time I watched a newly hatched Spotted Sandpiper trotting after a Least Sandpiper while its own parent was a considerable distance away.

Of course it is more than possible that the Buffle-head breeds in northeastern California, but unfortunately Mr. Ray's record fails to prove this, nor does he seem to realize what an extraordinary phenomenon was before him when he saw *both* parents attending the young. In the case of very aberrant ducks like *Erismatura* and *Dendrocygna* the male parent may assist as in all the geese and swans; also I believe there have been instances of some southern ducks, the Cinnamon Teal for one, that have been

seen with both male and female in attendance on the young brood. But after a lifetime spent among wild ducks I have yet to see the first indication of any solicitude for the young on the part of the male of any species.

In the case of the Buffle-head the males have totally disappeared (apparently all leave the country entirely) before the first broods of young are seen.—ALLAN BROOKS, *Okanagan Landing, British Columbia, November 25, 1921.*

**The Black Vulture in Colorado.**—On October 8 or 9, 1921, two young schoolboys, Richard Harvey and a boy named Baer, captured alive, on the foothills near Boulder, an adult male Black Vulture (*Coragyps urubu urubu*), breaking its wing. They tied it in a neighbor's yard to keep it alive until the University of Colorado Museum preparator returned from a short trip, but the neighbor turned it loose just out of town. A few days later two other boys, Elvin Watson and James Mitchell, found it dead in a ditch and brought it to the Museum, where its skin is now preserved. So far as I know there is no published record of this species for Colorado, and it is particularly interesting to find the first one for the state so far north. In 1900 Professor W. W. Cooke, in his Second Appendix to *The Birds of Colorado* (page 204), stated that the Black Vulture "has been taken in Western Kansas and probably will some time be found as a rare summer visitant in Southeastern Colorado"; but Boulder is 270 miles northwest of the southeastern corner of the state.—JUNIUS HENDERSON, *University of Colorado, Boulder, October 25, 1921.*

**A Winter Record of the Kern Red-wing.**—An adult male Red-winged Blackbird (cf. C 590, collection of D. R. Dickey) taken by van Rossem near Corona, Riverside County, on December 8, 1915, is strictly comparable with breeding specimens from Walker Basin, Kern County, and indicates a possible winter range for the race *Agelaius phoeniceus aciculatus*. The bill measurements are as follows: Culmen from base 25.9 millimeters (plus about 1 mm. broken off); bill from nostril 17.5 (broken as above); gonys 16.0; width at base 9.5; depth at base 9.5. This specimen was submitted to Mr. Joseph Mailliard, who concurs with us in our determination of its status.

During a recent trip in Kern County, two days (August 31 to September 1, 1921) were spent at Walker Basin, but not one red-wing was seen. Neither were any in evidence along the Kern River between Onyx and Isabella, where the types of *aciculatus* were taken. This would argue a departure from the breeding grounds immediately after the nesting season. Just what the winter range of this form is will probably not be ascertained for some time. The total number of individuals probably does not anywhere nearly reach a thousand. Such a number would form a very small proportion of the swarms of red-wings wintering in the lowlands and the taking of one would be very much a matter of luck.—D. R. DICKEY and A. J. VAN ROSSEM, *Pasadena, California, November 26, 1921.*

**Bird Fatalities Resulting from a Shipwreck.**—During the night of October 25, 1918, the Canadian Pacific Steamer "Princess Sophia" was wrecked with total loss of life, on Vanderbilt Reef, Lynn Canal, Alaska, some forty miles north of Juneau. Quantities of heavy fuel oil escaping covered the water for miles about, finally settling on the beaches. It is the writer's theory that the great loss of life, some 343 persons, was largely occasioned by the escaping oil.

When patrolling the shores of Admiralty Island and adjacent waters in a small steamer on October 28, looking for bodies from the wreck, a Murre (*Uria troille californica*) was seen swimming towards the vessel, occasionally assisting its feet with its wings. On coming close it was seen that its breast was heavily saturated with oil, and the wings and other parts to only a lesser degree. The bird came to within a few feet of the boat, which was then drifting, frequently raising itself on the water, shaking itself, and flapping its wings in efforts to get rid of the oil, and occasionally preening its feathers with its beak. The bird seemed not only devoid of fear but actually to wish companionship or a stable place to rest. Threatening movements only caused it to dive a few feet away, barely under the surface of the water, which gave excellent opportunity to observe the use of the wings in assisting the feet in the diving. It was finally killed

*published in the Condor, XXII, 1920, p. 157!*

with an oar, and on examination its plumage was found to be saturated with crude oil, particularly on the breast and wings. No injuries were in evidence and its plight was apparently due entirely to the oil.

Numerous other Murres were noted at no great distances, all more or less covered with the oil, which covered the surface of the water from a mere film to a heavy scum. The men who were patrolling the beaches for bodies of the wreck victims reported that there were many of "the same kind of birds" (Murres) dead and dying on the beaches, and frequently the searchers were startled by a bird still alive suddenly struggling and flopping about at their feet. Also, many gulls were observed to have stained breasts, but none were seen to be helpless. On October 30, when about 120 miles south of the scene of the disaster (near Cape Fanshaw), on a passenger steamer, the writer observed one gull with oil-stained breast join the ship for a distance. On January 1, 1919, at Wrangell, nearly two hundred miles south of the wreck, the writer observed a Glaucous-winged Gull (*Larus glaucescens*) walking about the streets, with a spot of discoloration about four inches in diameter on breast and sides that bore every evidence of being crude oil stain and quite possibly came from the wreck to the north in the preceding October.

The extent of the losses among the bird population due to this accident can not even be approximated, but it must have been considerable, as the wreck occurred a short distance north of waters much frequented by Murres, and prevailing winds and tides drove the oil southward for many miles. The twenty-three miles under observation on October 28 were from twenty-two to forty-five miles from the scene of the wreck with considerable shoreline intervening, so there is a good reason to believe that the fatalities to the birds that came under observation of the writer's party were but a small percentage of the total.—ERNEST P. WALKER, *Phoenix, Arizona, March 7, 1920.*

**Number of Birds Described as New from California.**—The undersigned has prepared a manuscript list of all the birds described from California. Species have been excluded where the type in all probability did not come from within the confines of the present state of California. Even so, it is found that 205 new names have been proposed for birds from California in the strict sense. But 45 of these specific or subspecific names have subsequently proven to be ill founded; in other words they are now considered as synonyms. Therefore 160 valid forms out of the total of 576 at this moment credited to the state list have been described from California—about 28 percent.

Furthermore, it is found that 51 different persons have participated in this sort of ornithological activity. As to responsibility of authors for new names: Grinnell has proposed 38, of which 6 are synonyms; Ridgway 28, with 8 synonyms; Oberholser 13, with 4 synonyms; Cassin 13, with one synonym; Vigors 11, with 4 synonyms; Baird 8, with 3 synonyms; Swarth 6, with no synonyms; Lawrence 5, with 1 synonym; Gambel 5, with 1 synonym; McGregor 5, with 1 synonym; etc. The rest of the 51 authors have named four or fewer real or supposed new forms.

It might be expected that the earlier describers, working at a time when "most everything was new" and when only "full species" were recognized, would have made the best "score", that is, the highest ratio of valid names to total names proposed. However, note that Vigors (1839) made but 63 percent, the lowest ratio among those who have proposed more than ten new names. The best score among those who have launched ten names or more was made by Cassin, 91 percent. A score of 100 percent is to be credited to Xantus, Henshaw, C. H. Townsend, Mearns, and Swarth, among those who have proposed from 3 to 6 new names. Is it to be inferred that the larger the number of names launched the greater the chances of slipping up?

There are numerous factors which enter into the game of species naming, upon which success will depend. Some of these factors are: availability of comparative material, knowledge of the literature, degree of development of the geographic sense, knowledge of plumages and of the meanings of variations, and discriminative acumen. While some of these may in more or less degree be matters of luck, yet in the long run personal qualifications like industry, concentrativeness and caution will figure largely. In systematics it is woefully easy, but forever a discredit, to launch synonyms. There is far less excuse for it now, with abundance of material and well indexed literature, than



in the days of Vigors.—J. GRINNELL, *Museum of Vertebrate Zoology, Berkeley, California, December 5, 1921.*

**The White Gyr Falcon in Montana.**—A bird as rare in the United States as the White Gyr Falcon (*Falco islandus*) seems worthy of recording whenever found and correctly identified. The specimen under consideration I believe has not been put on record up to the present date. It was sent to Mr. Oscar Gard, of Seattle, Washington, by Mr. Geo. B. Daniels, of Fort Benton, Montana. Mr. Benton writes that he shot the bird on November 18, 1917, on Shonkin Creek, just east of the town of Shonkin and about twenty miles from Fort Benton, Montana. When shot it was sitting on a post of a wire fence in very open country. The bird was in an advanced condition of decay by the time it reached Mr. Gard, who nevertheless made it into a very handsome specimen and it is now in my collection. Unfortunately the sex was not taken, but the extremely large size leaves practically no doubt that it is a female. It is very white and must have been fully adult, and is unquestionably one of the most beautiful birds that I have ever seen.—J. HOOPER BOWLES, *Tacoma, Washington, November 7, 1921.*

**A Specimen of the Markham Petrel.**—Mr. Chas. Fagan, chief wireless operator on the SS. "Santa Elisa," W. R. Grace and Co., has forwarded to the Biological Survey a petrel that proves to be the Markham Petrel, *Oceanodroma markhami* (Salvin). The bird was captured July 6, 1921, at sea off the coast of Peru at a point approximately thirty-five miles north of the port of Callao. *Oceanodroma markhami*, very close allied to *tristrami*, is distinguished from that bird by shorter tarsus, smaller foot, and somewhat more ashy tinge of the back and head. It differs from *O. melania* in more slender bill and in the grayish cast of the dorsal surface. Measurements of the present specimen are as follows: wing 175.5 mm.; tail 95 mm.; chord of exposed culmen 18 mm.; tarsus 23.3 mm.; middle toe with claw 23.5 mm.; outer toe with claw 22.5 mm.

The Markham Petrel was described by Salvin (Proc. Zool. Soc. London, 1883, p. 430) from a female specimen taken by Captain Markham in December, 1881, near the coast of Peru at lat. 19° 40' S., long. 75° W. (given incorrectly in the Cat. Birds Brit. Mus., xxv, 1896, p. 354, as lat. 10° 40' S.). A second specimen, also a female, was secured in the same region at lat. 23° S., long. 73° W. Loomis (Proc. California Acad. Sci., 4th ser., II, pt. II, p. 174) records two taken by R. H. Beck, one on August 1, 1905, in lat. 13° 28' N., long. 108° 52' W., and another September 1, 1905, near lat. 5° N., long. 87° W., about thirty miles south of Cocos Island. Captain R. Paefslser (Journ. Ornith., 1913, p. 49; 1914, p. 277) has published notes on the occurrence of this species on the west coast of South America but apparently merely from sight observation (no mention is made of specimens) so that his notes must be considered as open to doubt. The specimen secured by Mr. Fagan is of great interest as it is the first Markham Petrel that has come to the United States National Museum, and seems to constitute the fifth example of the species that has been recorded.—ALEXANDER WETMORE, *Biological Survey, U. S. Dept. Agriculture, November 21, 1921.*

**Possible Occurrence of the Blue-footed Booby in Southern California.**—A *Sula* of this type was seen by Mr. Edward J. Brown and the writer, between Anaheim Landing and Sunset Beach, Orange County, California, on October 25, 1921. It came from the ocean and made a complete circle around us at a distance of about a hundred yards. While ordinarily opposed to the publication of sight records, it seems to me permissible in this case; for a bird exhibiting such striking coloration and flight could hardly be mistaken for anything else. No claim is made for admission to the state list of the above species as we, of course, cannot say further than that it was a black and white *Sula*. As *S. nebouxi*, according to the A. O. U. Check-list, breeds in the Gulf of Lower California, the bird probably belonged to that form.—A. J. VAN ROSSEM, *Los Angeles, California, November 5, 1921.*

**Summer Record of Blue-winged Teal in California, and Notes on Other Birds.**—On May 21, 1921, at Buena Vista Lake, Kern County, California, I saw a pair of Blue-winged Teal (*Querquedula discors*) the male of which I secured. On sexing it I found

the testes fully enlarged, indicating, though not conclusively, that the pair might have been breeding in the vicinity. Winter records of this duck are not common and I can find no previous summer record.

A pair of San Diego Song Sparrows (*Melospiza melodia cooperi*) was seen on February 8, 1920, carrying nesting materials into the center of a clump of honeysuckle vines growing on our side fence in the city of Los Angeles. The next day I examined the clump and found a nest nearly completed. The first egg was laid February 15. I did not look at the nest again until February 22, when I found the one egg and the broken empty shell of another. Soon after this, heavy rains came on and the nest was deserted. Nor did the sparrows attempt to use the nest again or the nesting site that year.

During a trip of two weeks, October 16 to November 2, 1921, down the coast from San Francisco to Los Angeles, I made stops of a few days each at Moss Landing, Monterey County, Pismo, San Luis Obispo County, Goleta, Santa Barbara County, and Point Mugu, Ventura County. It was interesting to note the great abundance of Red Phalaropes (*Phalaropus fulicarius*), but the unusual fact was the large numbers of sick, dead and dying birds. I shot birds of this species that appeared strong and active but, in most cases, they were as much emaciated as the dead ones I picked up on the beach.

At Ludlow, San Bernardino County, April 17, 1921, I observed in the course of an afternoon at a corral where there were a water trough and two or three small cottonwood trees, sixteen species of birds, among which were two pairs of the Lark Bunting (*Calamospiza melanocorys*), one pair of which I collected. This place is located deep in the Mohave Desert, but the water and a few shade trees seem to attract quite a number of birds.—CHESTER C. LAMB, *Los Angeles, November 22, 1921.*

**Corrections of Errors in Pacific Coast Avifauna no. 14.**—*Asio wilsonianus*. Long-eared Owl. On page 68, for "Stevensville, Ravalli County, April 14, 1912, 2 eggs," read Corvallis, instead of Stevensville.

*Junco hyemalis mearnsi*. Pink-sided Junco. "It has also been found . . . in the Bitterroot Valley in migration"; and "Corvallis, March 22, 1913" (page 128). This specimen was taken May 22 instead of March 22, which would bring it in the breeding season instead of in migration. The exact locality was eight miles east of Corvallis at 4500 feet elevation, in heavy yellow pine and Douglas fir forest.—BERNARD BAILEY, *Elk River, Minnesota, October 10, 1921.*

**An Inland Occurrence of the Common Tern.**—A male of the year of the Common Tern (*Sterna hirundo*) was taken by van Rossem at Victorville, San Bernardino County, California, on September 22, 1921. When shot, it was on a sandbar in the Mohave River, in company with a few Killdeers. No other terns were observed during the eight days spent in that vicinity.—D. R. DICKEY and A. J. VAN ROSSEM, *Pasadena, California, November 25, 1921.*

**Burrowing Owl off the Virginia Coast.**—While on depth-charge watch at night just out of Hampton Roads enroute to New York, October 22, 1918, I observed a small owl which for four hours flew about the quarter-deck of the vessel but eluded capture. The next morning a marine caught the bird perched on one of the depth-charges, and on examination it proved to be a Burrowing Owl (*Speotyto cunicularia*). It was very docile and eagerly gulped down pieces of raw beef fed by hand. As the marine wished to take it ashore as a pet I was unable to secure it, and though I positively identified it as a Burrowing Owl I could not determine its subspecific characters. One would, however, presuppose the Florida bird (*Speotyto cunicularia floridana*), rather than our western representative. At all events its appearance so far from its known range seems worthy of record even at this late date.—WM. DUNCAN STRONG, *Berkeley, California, November 30, 1921.*

**Rare Birds in Arizona and New Mexico.**—Harris Hawk (*Parabuteo unicinctus harrisi*). While on an auto trip through Arizona I took an adult male on the Superior Highway about fifteen miles east of Mesa, Arizona, on March 15, 1921. Three were seen together in the giant cactus association. I have never been able to find this species in southwestern New Mexico.

Heermann Gull (*Larus heermanni*). An adult male was brought to me on March 20, 1919. It had been found dead on Pinos Altos Mountain, nine miles north of Silver City. On making up the skin I found the bird to be in very poor flesh, and a small shot found in its body indicated that it had been crippled, probably on one of the small irrigation ponds south of here. Mrs. Florence Merriam Bailey advises me that this is a new record for New Mexico.

Great-tailed Grackle (*Megaquiscalus major macrourus*). I took an adult male May 24, 1920, on an irrigation pond on the Mimbres River, thirty miles southeast of here. No others could be found at this time or on several subsequent trips. Mrs. Bailey advises me that the only other records for the state are of a specimen taken at Las Cruces May 15, 1913, and a report of a pair nesting at La Mesa.

Chimney Swift (*Chaetura pelagica*). A female was taken May 22, 1921, on the Mimbres River, thirty miles southeast of here, in Luna County. It was flying alone at about six p. m. Wing measures 127.1 mm., and tail 42.4 mm. I am indebted to J. Eugene Law for identification and measurements.—R. T. KELLOGG, *Silver City, New Mexico, October 24, 1921.*

**Notes on the Voice of the California Screech Owl.**—The following notes and observations were made in the vicinity of Palo Alto, California, from June 1 to November 1, 1921.

The California Screech Owl (*Otus asio bendirei*) is a very tame and friendly bird. At times one can be approached to within arm's length. One curious fact is that when a light is put full in the face, at distances ranging from five to twenty feet, the bird does not seem to be in the least blinded, but looks over and past the light, and stares at the face of the observer. The eyes do not ordinarily glow, but are very distinct, the pupil and iris standing out in strong contrast. On only one occasion have I seen this rule broken. The owl in this case was within five feet, and on the same level with the light. It looked steadily at my face, over the light, but its eyes glowed with a soft honey color.

I have divided the calls under six separate headings, but there are a great many more, as they shade off into each other a good deal. The six noted here, however, are always clear and distinct. The first is the familiar, soft, quavering, "oo-oo-oo", known to nearly everyone. It is generally repeated steadily and monotonously. It seems to be a call of contentment, given when the bird is full fed.

The second is the same as the first, but with a soft whistling undertone, such as is produced by whistling with the edge of a card against the lips. I have heard this call only during the breeding season. It seems to be used to call another bird. On several occasions I have found a pair of the birds sitting side by side, one of them, presumably the male, giving this call, while the other answered with a sharp whistle. The two calls were exchanged, back and forth, for some time as though the birds were carrying on a conversation.

Number three is a liquid, clucking, "prit, prit", which seems to indicate curiosity. It is sometimes accompanied by a snapping of the beak. One bird swooped at me on several consecutive nights, going over my head and snapping his bill fiercely as he passed. I finally turned my light on him when at the bottom of his swoop and within arm's length, which seemed to disconcert him, as he flew into a neighboring tree and began to cluck and snap his beak.

The fourth is a loud clear scream, a most blood-curdling sound. It may be said to resemble the screeching of an enraged cat. I have heard it on only one occasion. It was repeated several times on the night of August 7, 1921, though whether by the same individual each time I could not determine. When I approached the tree from which the screaming came, the owl dropped into the inquiring, "prit, prit".

Number five is a guttural croaking, sounding exactly like the croaking of a heron. I have heard this call on only two occasions. The first time I was unable to get my light on the bird, and thought it a night heron, but the second time I saw the owl plainly. The call consists of only a single note.

The sixth is a high pitched, whining note resembling the crying of a puppy.

The first three calls are the most common. In fact after midnight there is nearly always an owl within hearing giving one of the calls. They can and do change from

one call to another and back again. During the breeding season they do not seem to have any regular hunting ground, but when the young are grown they become solitary, and do not go very far from home. Although they are very plentiful and I have spent much time in observing them, I have never been able to find a nest, or the hole of a solitary individual. They make good pets, eating raw meat, or mice, and becoming quite tame. When irritated they make comical efforts at defence, throwing themselves on their backs, snapping their beaks and grasping with the claws. They are too small to be serious antagonists, however. One which I kept for some time would "sing".—PAUL BONNOT, *Stanford University, California, November 7, 1921.*

**Early Nesting of the Tricolored Blackbird and Mallard.**—At Walker Basin, Kern County, California, on April 2, 1921, van Rossem made note of the following nestings which so far antedate anything published that a record of them is in order.

*Agelaius tricolor.* Colony of about twenty pairs in an old dead tule patch. From one fresh to four eggs incubated were noted, and one female was seen carrying food, probably to small young.

*Anas platyrhynchos.* Nest with eight apparently fresh eggs in a clump of grass near the small stream which winds about and through the meadow.

These dates would be early even for the lowlands, but seem extraordinarily so for this mountain meadow where the temperature was close to freezing at night, and where several inches of snow fell on the night of the 3rd of April.—D. R. DICKEY and A. J. VAN ROSSEM, *Pasadena, California, November 25, 1921.*

**A Correction: Brewer Blackbird Not Occurring in Northern British Columbia.**—In the Condor for March, 1919 (vol. 21, p. 33), under the title of The Summer Birds of Hazelton, British Columbia, I recorded the common nesting and the taking of two specimens of the Brewer Blackbird (*Euphagus cyanocephalus*). At the instigation of Mr. H. S. Swarth, I recently re-examined these birds. They consist of an adult male and a young bird in post-juvenile plumage. The adult is worn and dull and shows more purple reflection on the head than is usual in the Rusty Blackbird. The juvenile shows no indication at all of the rust so characteristic of the first winter plumage of that species. The measurements, however, are plain, and, in spite of superficial resemblances to *cyanocephalus*, I am compelled to reconsider my first too hasty conclusion and re-identify both birds as Rusty Blackbirds (*Euphagus carolinus*). There is, therefore, at present no record of the Brewer Blackbird in that section of British Columbia. In extenuation of my apparent carelessness I would like to state that at the time of writing the above paper the Rusty Blackbird had not been recorded as breeding in the Province and its occurrence there was unexpected.—P. A. TAVERNER, *Ottawa, Ontario, November 21, 1921.*

**A Pigmy Owl Bathing.**—On September 28, 1921, while camping at the easterly end of Kneeland Prairie, Humboldt County, California, in company with Mr. Chester C. Lamb, the latter came in from a tramp in the woods with the report that he had seen a Coast Pigmy Owl (*Glaucidium gnoma grinnelli*) taking a bath. He described the bird as standing on the edge of a small cattle trough beside the trail and going through the process of ablution in about the same manner as any other bird. The trough was full to the brim and the little owl was dipping and dabbling in the water, finally shaking itself and preening its feathers. Later the bird was secured and proved to be a male still in partial moult, with few but pin-feathers on the throat.

Several ornithologists to whom I mentioned this matter said that they had never before heard of an owl bathing and had never accredited this bird with a desire for such a performance. Mr. Chase Littlejohn tells me, however, that at one time he had several Barn Owls (*Tyto pratincola*) in captivity for a short period and discovered that they were very fond of a bath. They were kept in a rather dark place to which they quickly grew accustomed, soon becoming quite tame. He used to watch them a good deal, to study their habits and attitudes, and frequently saw them bathing in a large vessel of water maintained for their use. Apparently they bathed every day; for if there were days in which he did not actually see them bathe he almost invariably noticed some sign of their having done so, either in the way of wet feathers, water on the floor, or at least some token.

Possibly owls usually bathe at night when no one would be likely to see them, which may account for our lack of knowledge on this point.—JOSEPH MAILLIARD, *California Academy of Sciences, San Francisco, December 5, 1921.*

**The California Brown Pelican in the State of Washington.**—The status of the California Brown Pelican (*Pelecanus californicus*) in the state of Washington seems, hitherto, to be founded altogether upon sight records and one or two mounted specimens that are supposed to have been collected in the state. The sight records were made by Suckley and other old time observers, while the mounted birds are even more uncertain, if possible, for proper scientific work.

It is with pleasure, therefore, that I am able to place on record a fine example of this bird that was turned over to me in the flesh a few days ago. It was collected on October 30, 1921, by Mr. Roger Evans, of Kapowsin, Washington. The locality was Lake Kapowsin, which is situated among the eastern foothills of the Cascade Mountains, and about one hundred and twenty miles from the Pacific Ocean. It was alone and no more were seen; neither have I had any other reported from elsewhere. The appearance of the bird so far from salt water may be accounted for by the fact that an unusually severe storm of several days duration took place just prior to its capture. Mr. Evans very kindly turned the bird over to us for the use of science, and it is now in the collection of Mr. D. E. Brown, in Seattle, Washington. It is an immature male, and presumably a bird of the present year.—J. HOOPER BOWLES, *Tacoma, Washington, November 7, 1921.*

**The "Anthony Vireo" Not a Tenable Subspecies.**—*Vireo huttoni obscurus* Anthony has held its place as a valid subspecies in both the second (1895) and the third (1910) editions of the A. O. U. Check-List. Also Ridgway recognized it in Part III (1904) of his Birds of North and Middle America.

In April, 1921, I had the chance of examining the type skin of this supposed race in the ornithological collection of the Carnegie Museum at Pittsburgh. This type, apparently not hitherto recorded, is now no. 16981, Carnegie Mus.; female; Beaverton, Oregon; March 20, 1890; orig. no. 2671, A. W. Anthony. I compared it with the other material in the Carnegie collection, and came to the conclusion that the name *obscurus* does not apply to a tenable race.

It happens that this same conclusion had been come to by Rhoads years ago (see Auk, x, July, 1893, pp. 238-241). And it seems, according to Rhoads, that Anthony himself had come to doubt the validity of *obscurus*. It is curious that these circumstances did not seem to weigh against the acceptance of the name in the 1895 A. O. U. Check-List.

Anthony, in his original description of *obscurus* (Zoe, i, December, 1890, pp. 307-308), was, I think, misled by the seasonal conditions of coloration. The "rich suffusion of olive and yellowish tints" emphasized as the main character of *obscurus* is common to birds in fresh, or at least unfaded, plumage from throughout the range of *Vireo huttoni huttoni*. Those vivid tints are fugitive, and they go fastest and most completely in sunny as compared with cloudy climates; there is geographic variation in rate of fading (see Grinnell, Auk, xix, April, 1902, pp. 128-131). Southern California birds lose the "blush" of the new plumage sooner and more completely than birds of western Oregon. But as far as I can now see, from a repeated examination of the extensive material in the Museum of Vertebrate Zoology, the intrinsic color tone is very nearly the same all the way from Washington (a bird at hand from Tacoma) to San Diego County, California. I was misled in precisely the same way Anthony was, when I described the supposed form *mailliardorum* from Santa Cruz Island (see Condor, v, November, 1903, p. 157), and evidently Bishop was similarly confused when he named *oberholseri* (Condor, vii, September, 1905, pp. 142-143) from San Diego County!

Now, Rhoads (loco citato) did not stop with showing that *obscurus* was untenable; he described a new race of his own, *insularis*, from the southern end of Vancouver Island. He had but three specimens, two of which he made the "types". These, as compared with *huttoni*, he describes as showing "over the whole plumage" a "sooty suffusion". I am tempted to suggest that these may have been town-smoked birds. Hutton Vireos from Vancouver Island are notably rare in collections. In the Museum of Vertebrate Zoology there are but two, both from Victoria. Both are dark as compared with

Monterey *huttoni*; but both look to me to be smoked. I wouldn't care to rest the case for or against *insularis* on this scanty material. But before this name is given formal recognition by the A. O. U. Committee on Nomenclature, perfectly fresh, unfaded material should be available in fair quantity.—J. GRINNELL, *Museum of Vertebrate Zoology, Berkeley, California, December 5, 1921.*

**Some Hawks of Harney Valley, Oregon.**—My work in the United States Biological Survey has taken me into Harney County, Oregon, several times during the last two years. On every visit I have been impressed by the abundance and variety of hawks in this district, and I have kept rough notes regarding these birds. A few of these notes are presented. In 1919, for a week beginning September 12, there was an amazing mixed flight of hawks in which Cooper Hawks, Prairie Falcons, and Duck Hawks were conspicuous. During this week, I saw at least a dozen Duck Hawks, more than equal to all of my other records. The following notes were made during these trips.

**Turkey Vulture (*Cathartes aura septentrionalis*).** Turkey Vultures were common in the valley, but my attention was particularly drawn to them during August, 1919, when trying summer poisons on jack rabbits. Such numbers of vultures, ravens, crows, and magpies descended on the fields where the poisoning operations were carried on as to make it necessary to reach there before daylight in order to count the poisoned rabbits. From fifty to one hundred each of ravens and vultures usually arrived by daylight, accompanied by several times that number of crows and magpies.

**Marsh Hawk (*Circus hudsonius*).** Marsh Hawks have been common and even abundant on each of my visits to the valley. I have often seen them worrying the jack rabbits but have yet to see them catch one.

**Sharp-shinned Hawk (*Accipiter velox*).** A few of these little hawks were included in the flight of September, 1919.

**Cooper Hawk (*Accipiter cooperi*).** This species was one of the most conspicuous in numbers in the September flight mentioned above. Most of those observed were not yet in adult plumage. They were astonishingly tame, sitting on fence posts and telephone poles while we drove by in a car. While the larger hawks frequently do this, my previous experience with this species has been entirely to the contrary.

**Western Red-tail (*Buteo borealis calurus*).** This is a common species, found on every visit to the valley.

**Swainson Hawk (*Buteo swainsoni*).** This is the most common species in the valley. On May 24, 1920, twenty-seven Swainson Hawks were counted sitting on the posts along one side of a small alfalfa field near Burns. Several had Oregon ground squirrels in their talons and most of them seemed to be resting after a hearty meal. The field was swarming with squirrels, and catching all that was necessary for food was apparently an easy task for these hawks.

**Rough-legged Hawk (*Archibuteo lagopus sancti-johannis*).** A few of these hawks were seen on October 24-30, 1920. Judging from the number observed in adjoining districts during the winter they probably increased considerably later in the season.

**Ferruginous Rough-leg (*Archibuteo ferrugineus*).** On May 24, 1920, Stanley G. Jewett and myself saw at close range an adult hawk of this species, the only one noted in the valley at any time.

**Golden Eagle (*Aquila chrysaetos*).** Golden Eagles are common in Harney Valley, and abundant compared to their number in any other district with which I am familiar. I have had as many as five in sight at one time. On September 13, 1919, I watched two in pursuit of five Canada Geese. The eagles were considerably behind and high above the geese, which were making frantic efforts to reach a pond known as Potter Swamp. The eagles were gaining rapidly, but all disappeared over a ridge before the chase was finished. A few days after this, three were seen harrying a jack rabbit which they caught and killed; all three were near the dead rabbit when we passed along the road in a car. On October 26, 1920, two eagles and a number of magpies were found feeding on poisoned rabbits.

**Prairie Falcon (*Falco mexicanus*).** This hawk is common in the valley and was particularly so during September, 1919. One female followed our car along the road for some distance until finally killed by a well-directed shot. Apparently, she was after the birds flushed by the car from the sage brush along the road.

Duck Hawk (*Falco peregrinus anatum*). About a dozen Duck Hawks were seen during the September flight. On the thirteenth, a flock of Cinnamon Teal whizzed past my head as I stood on the bank of Silvies River. They were traveling at a terrific rate of speed, but not until they had passed did I see the Duck Hawk close behind. Within a few seconds after passing me it struck one of the teal, and made for a nearby cliff with its victim. On August 24, late in the evening, while with a companion trying to secure a yellow-headed blackbird, a Duck Hawk darted viciously into a flock of blackbirds. As it was about to strike, it saw me and swung over my companion who brought it down as it passed overhead. It proved to be a fine adult male.

Pigeon Hawk (*Falco columbarius columbarius*). An immature female bird was secured on September 16, 1919, as it flew over.

Desert Sparrow Hawk (*Falco sparverius phalaena*). This is very common during September and October; it is less so in May and June, but is in evidence along the roads every day.—IRA N. GABRIELSON, *Portland, Oregon, October 24, 1921.*

**The Validity of the Catalina Island Quail.**—A series of sixteen quail from Catalina Island, of which thirteen are winter and three are fresh fall specimens, was recently examined by us. These bear out precisely the characters as given by J. Grinnell in his description of the form *Lophortyx [californica] catalinensis*, in *The Auk*, vol. 23, 1906, pp. 262-265. An additional character to which we wish to call attention is the wing formula of *catalinensis* as compared with *vallicola*. In *catalinensis*, the seventh primary is longest in thirteen out of the sixteen (or 81.25 percent), and the seventh and sixth are equal and longest in the remaining three (or 18.75 percent). The eighth primary is equal to or longer than the fifth in exactly the same high proportion. In a series of seventeen *vallicola*, from the San Diegan district, the seventh primary is longest in only three birds (or 17.65 percent), the remaining fourteen having the sixth, sixth and seventh, or fifth, sixth, and seventh longest. The eighth is equal to or longer than the fifth in only four (or 23.53 percent). It will thus be seen that the Island wing is the more pointed of the two. The wing formula of *L. californica californica* seems to be quite similar to that of *catalinensis*; but as most of our birds are moulting, we cannot be positive on this point.

Three birds from the southern San Joaquin Valley agree in some particulars of coloration with those from Catalina, namely, in color of flanks and broad striping on under tail coverts. However, the resemblance ceases here, for they are quite as small as the average *vallicola* from the San Diegan district (see Grinnell, *Auk*, vol. 23, p. 263). The one available quail from Los Coronados Islands (collection of H. Wright) has the small foot and bill of *vallicola*, but is too badly worn to give any comparative color values.

*Catalinensis* is a perfectly valid race and is quite as well differentiated from *vallicola* as is *vallicola* from *californica* proper. The pronounced characters preclude the possibility of artificial introduction, and it is difficult to understand why it has not been given equal standing with other insular forms, such as the horned larks and song sparrows, not to mention the San Clemente House Finch!—D. R. DICKEY and A. J. VAN ROSEM, *Pasadena, California, November 26, 1921.*

**Virginia Rail and Flammulated Screech Owl in the San Bernardino Mountains.**—On July 16, 1921, and again on the 17th, a Virginia Rail (*Rallus virginianus*) was seen near the mouth of Rathbun Creek, Big Bear Lake. It was feeding in marshy ground beside the road, and when passed in an auto could be closely observed. When we returned on foot, however, we could not find it.

On July 17 and 18, both morning and evening, the peculiar, ventriloquial, notes of the Flammulated Screech Owl (*Otus flammeolus*) were heard in the vicinity of the I S Ranch, Big Bear Lake; and on the 19th and 20th we heard the same notes at the Fish Hatchery at the north base of Sugarloaf Mountain. We did not succeed in seeing any of the producers of these strange calls at either place, repeating our experience with this species at Dry Lake, July, 1920, where we failed on three evenings to catch sight of one.—JOHN McB. ROBERTSON, *Buena Park, California, December 4, 1921.*



## RECORD OF BIRDS BANDED

Bands: 6601-6611 45001-45005 45020 48120-48128 49001-49007 49379  
 28820 45007-45011 45617-45622 48161-48170 49010 55031

Mrs. Amelia S. Allen, at Berkeley, Calif. (date ?).

*Hylocichla guttata* (subsp.), (1) 49001. *Baeolophus i. inornatus*, (5) 45001-45005.

February 11 to March 29, 1919.

*Chamaea f. fasciata*, (3) 45007-08-20. *Pipilo c. crissalis*, (1) 49010.

*Passerella i. (annectens ?)*, (1) 49002.

January 12 to June 23, 1920.

*Carpodacus m. frontalis*, (1) 45011. *Zonotrichia coronata*, (2) 49004-05.

*Chamaea f. fasciata*, (1) 45010. *Zonotrichia l. nuttalli*, (2) 49006-07.

*Regulus c. (cineraceus ?)*, (1) 45009.

June 16 to October 31, 1921.

*Troglodytes a. parkmani*, (10) 48161-48170. *Colaptes c. collaris*, (1) 55031.

At Boulder Creek, Santa Cruz County, Calif., July 12, 1919.

*Junco o. pinosus*, (1) 49003.

H. C. Bryant, at Berkeley, Calif., February 23 to May 3, 1921.

*Hylocichla guttata* (subsp.), (1) 49379. *Junco oreganus* (subsp.), (6) 45617-45622.

J. E. Law, at Berkeley, Calif., October 28, 1921.

*Melospiza m. santaecrucis*, (2) 6606-07.

At Los Angeles, Calif., September 25 to November 16, 1921.

*Melospiza m. cooperi*, (2) 28820, 48121. *Zonotrichia l. gambeli*, (15) 6601-6605,

*Zonotrichia l. (nuttalli ?)*, (2) 48120, 6608-6611, 48123-48128.

-22.

## EDITORIAL NOTES AND NEWS

We wish to call especial attention to the "open letter to *Condor* contributors" which appears on the outside of the back cover of this issue. The Editors simply want the help of contributors in making an improved magazine. The *Condor* cannot grow in size very much, because of limited money resources, but it can be bettered in quality and scientific value, almost without limit. We invite vigorous coöperation in this regard; also constructive criticism from those of our readers who do not happen to be contributors of articles. Some very helpful suggestions have already come to us from such sources.

The reports of the Business Managers of the Cooper Ornithological Club, Messrs. Law and Chambers, for the year 1920 and for the half year to July 1, 1921, have been filed with the Board of Governors and with the Secretaries of the two Divisions. These reports go into great detail, so that every item of property, all sources of income, and all matters of expense may be learned with accuracy and ease. Space prevents reproducing any large portion of the figures here. Some selected ones, however, will doubtless prove of general interest. During 1920 total receipts (general fund) amounted to \$2168.29; total disbursements, \$2146.37. On

July 1, 1921, the Club's endowment fund contained \$3750, invested in government bonds. The statements indicate a healthy condition, with the burden of high war costs all but discounted without an increase in dues. In another year the war account promises to be wiped out.

A late book of unusual interest is "Early Annals of Ornithology" by J. H. Gurney (H. F. and G. Witherby, London, 1921, 240 pp., 36 ills.). It deals chiefly with British birds and consists of a collection of ancient references and accounts of birds from all sorts of sources, accompanied by critical comments and explanations. Among scores of interesting things we learn that, in the sixteenth century, herons were highly prized for the table, and also that a system of branding domestic swans was in common practice, which, although the beak was the portion of the bird marked, reminds us of the system of bird-banding in vogue today.

Recent articles in the *Condor* and elsewhere have dealt with the speed of flight in birds. It becomes clear that a great many extravagant figures in this regard have appeared in the older literature, and even modern books and articles in the sports and adventures class are full of wild statements.

Now, well attested, often accurately measured, observations are accumulating. A valuable summary of these is presented in a paper in the *Ibis* for April, 1921 (pp. 228-238), contributed by Colonel Richard Meinertzhagen, D. S. O., M. B. O. U. Much of the exact data was secured during the war when instruments of observation at anti-aircraft stations were employed and birds in flight used as objectives on which to practice. In conclusion, from all the data at hand, this author places the normal and migratory rates of flight, in miles per hour, of certain birds as follows: Corvidae, 31-45; smaller Passeres, 20-37; Starlings, 38-49; Falcons, 40-48; Geese, 42-55; Ducks, 44-59; tame Pigeons, 30-36; Waders, 34-51, but mostly 40-51. When pressed (aeroplane in pursuit), Golden Plover attained to 60 miles per hour; a Lammergeier (nose-diving) to 110 miles per hour.

#### MINUTES OF COOPER CLUB MEETINGS

##### NORTHERN DIVISION

SEPTEMBER.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology, September 22 at 8 P. M. President Wright presided and those in attendance were: Mesdames Allen, Bamford, Burk, Flinn, Grinnell, Mead, and Schlesinger; Messrs. Bell, Cooper, Evermann, Grinnell, Hunt, Johnston, McLean, Palmer, Storer, Taylor and Wright; visitors: Mrs. Bogle, Mrs. Evermann, Mrs. Hunt and Mr. Stow.

August minutes for Northern and Southern Divisions were read, the former being approved. Names proposed were Mrs. Sara S. Bogle, Berkeley, by Tracy I. Storer, and Miss Clare E. Johnson, San Francisco, by Mrs. E. D. Roe. Among the reports from the members who had spent vacation time in the open were: Notes on the Olympic Mountains by Dr. Walter P. Taylor; observations in southern Oregon, by Mr. R. H. Palmer; in Alpine County, by Mr. Richard Hunt; in the Tahoe region, by Mr. Storer and Mrs. Mead; at Cisco, by Mrs. Schlesinger; on Tuolumne Meadows, by Miss Flinn; in the Coulterville region, by Mrs. Grinnell; and in the Chiricahua Mountains, Arizona, by Mr. Donald McLean. Adjourned.—AMELIA S. ALLEN, *Secretary*.

OCTOBER.—The regular meeting of the Northern Division of the Cooper Ornithological Club for October was held on the evening of the 27th at 8 P. M. at the Museum of Vertebrate Zoology. President Wright

was in the chair and the following members were in attendance: Mesdames Allen, Bamford, Bennet, Blake, Bogle, Burk, Flinn, G. T. Roe, Schlesinger and Wythe; Messrs. Carriger, Dixon, Evermann, Grinnell, Jos. Mailliard, McLean, Storer, Stow, Swarth, White, and Wright; visitors: Miss Davenport, Mrs. Evermann, Mrs. Storer, Mrs. Swarth, Mrs. White and Mr. Bunker. The minutes of the September meeting of the Northern Division were read and approved and the minutes of the meetings of the Southern Division in August and September were read. The following names were presented: Willard Fordyce Grinnell, Berkeley, by J. Eugene Law; Frederic C. Torrey, Berkeley, and Harry P. Stow, Alameda, by J. Grinnell; Dr. Robert Dill, Reno, Nevada, and Zola Zinn, Seattle, Washington, by R. H. Palmer.

The program for the evening was given by Mr. H. S. Swarth, who recounted many interesting ornithological experiences in British Columbia. Adjourned.—AMELIA S. ALLEN, *Secretary*.

NOVEMBER.—The November meeting of the Northern Division of the Cooper Ornithological Club was held on the 17th at the usual time and place. President Wright was in the chair, and the following members were present: Mesdames Allen, Boyle, Burk, Flinn, Grinnell, E. T. Mead, C. Meade, G. T. Roe, and Schlesinger; Messrs. Gignoux, J. Grinnell, W. F. Grinnell, Joseph Mailliard, McLean, Storer, Swarth, and Wright. Visitors: Mrs. Calder, Mrs. Evermann, Mrs. Fredericks, and Miss Sherman.

The minutes of the October meeting were read and approved, and the following names were presented for membership: Dr. G. Dallas Hanna, San Francisco, by Dr. Barton W. Evermann; Emily Dolores Lalage, Alameda, by Margaret W. Wythe, and Paul Fredericks Bunker, Berkeley, by H. C. Bryant.

Mrs. Fredericks of the California Botanical Society brought to the notice of the Club the law, recently passed, relating to the gathering and sale of toyon berries. Mr. Storer revived the question of the possibility of securing the adoption by the Berkeley City Council of an ordinance relating to the licensing of cats. It was decided to review the situation at the next meeting. Business concluded, Mr. Joseph Mailliard told of his experiences with birds in Humboldt County during the fall migration. Adjourned.—AMELIA S. ALLEN, *Secretary*.

# THE CONDOR

## A Bi-Monthly Magazine of Western Ornithology

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Volume XXIV

March-April, 1922

Number 2

[Issued April 6, 1922]

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### A LARGE TERN COLONY IN TEXAS

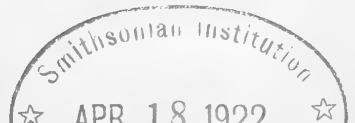
By J. R. PEMBERTON

WITH ELEVEN PHOTOS

DURING the first two weeks of May, 1921, while working the country between Brownsville and Point Isabel, Cameron County, Texas, and the shores of the many lagoons near Point Isabel, and also on a trip to Green Island, I was constantly wondering where the great numbers of terns which were nearly always in view could be nesting. It was not until May 14, when I was working about eight miles west of Point Isabel, that I found the place. I was searching for nests of the Long-billed Curlew in the grassy meadows adjoining the sloughs and salt-water covered areas of this delta country of the Rio Grande River. I noticed both Gull-billed and Common terns were fishing in the waters; but it was not for some time that it finally dawned on me that they were carrying the fish away with them instead of eating them on the spot. This, of course, was news, so I ascended an eminence of perhaps twenty feet elevation and watched the terns. They all flew straight away toward the center of a very large body of water called the Bahia Grande, and using my glass I saw a low flat island and hovering over it in several places a shimmering, fluttering, white mass which meant only one thing—there was the center of operations of the terns.

I judged from experience that the mile or so of water which separates the mainland from the island would not be deeper than three feet, but in order to carry some cameras I got a small boat and made my first visit on May 16 in company with a Mexican fisherman. On that trip, by constant soundings, I found that the water's depth was never greater than two feet, so my next trip on May 23 was made by wading across. Mr. A. J. Kirn accompanied me on the second trip. R. D. Camp, who is both Federal and State Game Warden in that district, made a trip with Mr. Robert Runyon on June 5. The remarks on each of the breeding species which follow are drawn from notes made on all three of the trips.

Now, a large tern colony may be an old story to some of our fraternity, but I am sure that the vast majority would have been as interested as I was upon first seeing many thousands of terns belonging to seven different species rise from their nests. That matter of the seven species is important—here was a



chance to note the habits of each and compare them on the spot with one another instead of after, as in some cases, years of elapsed time. Also a collector of eggs had here a wonderful opportunity to acquire a representative series showing the maximum variations in color, shape, size and markings in thousands of eggs. For the photographer with sufficient time and apparatus the opportunities were legion.

The breeding grounds turned out to be on three separate islands. To the west is a true island of about ten acres extent and rising to a height of twenty feet above the water level. A bluff forms its southeastern side and the top slopes northwestward into the water. The prevailing winds are from the southeast, so that this island has well-sheltered north and northwest shores. East of this island a distance of a half-mile are two shoals of dried mud fairly well covered with salt grass and some associated shrubs. These two shoals are of about twenty acres extent each, and they do not rise out of the water at any place more than a scant foot. Both have an irregular outline, and the north-



Fig. 14. NEST AND NEWLY HATCHED YOUNG OF THE GULL-BILLED TERN. CAMERON COUNTY, TEXAS.

Photo by Robert Runyon.

ernmost of the two has an encroaching embayment which occupies a part of the center.

It was the southernmost of the two mud shoals which was first visited. As it was approached in a small boat the white cloud above resolved itself into birds. As the landing was made and we stood up in the boat an almost unbelievable number of terns rose from the grass and joined those already in the air. The din and shrieks, made in great part close to one's head, rendered conversation practically impossible. The air was full of flying terns. But this effervescent demonstration soon blew its head off and a large part of the birds settled back upon their eggs. It was a hot afternoon, the sun glaring down from a cloudless sky and glaring up from the salt crystals in the mud. As we walked, or rather waded in the mud, for the crust was not strong enough to support us, across a bare area toward the grassy zone, we had to pick our way carefully in order not to smash eggs underfoot. Nests seemed everywhere.

Even a casual glance into the air or an analysis of the sounds coming out of it showed one that there were several species of terns present. A careful check showed eight species, and this number was not changed subsequently. They were, in order of abundance, the Gull-billed (*Gelochelidon nilotica*), Common (*Sterna hirundo*), Least (*Sterna antillarum*), Caspian (*Sterna caspia*), Royal (*Sterna maxima*), Black (*Hydrochelidon nigra surinamensis*), Cabot (*Sterna sandvicensis acutiflvida*), and Forster (*Sterna forsteri*). We found them later to be all breeding with the exception of the Black Tern, which was evidently a tardy migrant, loath to leave these "happy hunting grounds" for the north.

The Gull-billed Tern was far and away the most numerous, and I hesitate to estimate the population. Remembering my Green Island experience with the Reddish Egrets I would certainly say that this tern was present in double or possibly treble the number of the Egrets at Green Island. It would certainly be many thousand, and apparently all were breeding. We later found that



Fig. 15. NEST AND EGGS OF COMMON TERN. CAMERON COUNTY, TEXAS.

Photo by Robert Runyon.

this species occupied all three islands and was the only one which did so. On May 16, breeding was at its height. Building had finished and all nests contained either eggs or young.

The nests varied in architecture greatly. Some consisted of a mere cleared spot surrounded by a rim of broken bits of shells, dry mud, and fragments of salt grass stems. Others were considerable piles of grass and mud, well dished at the top, and partly lined with finer salt grass. In a few of the latter class the rim was ornamented with bits of shell. On the western island the nests were arranged in more or less of a row, following the high water limit; but on the mud shoals they were placed apparently at random, some amid the grass and others in the bare spots. Full sets of eggs consisted of two or three, no sets of four being found. The degree of incubation varied from perfectly fresh eggs to eggs which were visibly hatching. On the 15th all young were in the downy stage and were colored a dull tan which harmonized closely with

the earth and rendered them very inconspicuous when not moving. Many of them hit for sea as we came near them and swam some distance away from shore. In many nests were found freshly caught fish, but whether destined for the brooding birds or the soon-to-be-hatched young was not apparent. There were many dead young and some were seen killed by the Caspian Terns, who were doubtless furious at our intrusion into their homes. On May 23 more young were in evidence and many were in their pin feathers, much more spry and wary, running without falling, and swimming with ease.

The Gull-billed Tern is extremely vociferous when its nest is approached, but not nearly so much so as is the Common Tern. The latter is quite pugnacious and its voice is sharper, shriller and more nervous in its character than that of the Gull-billed Tern. There is a monotonous beat or timbre to the cry

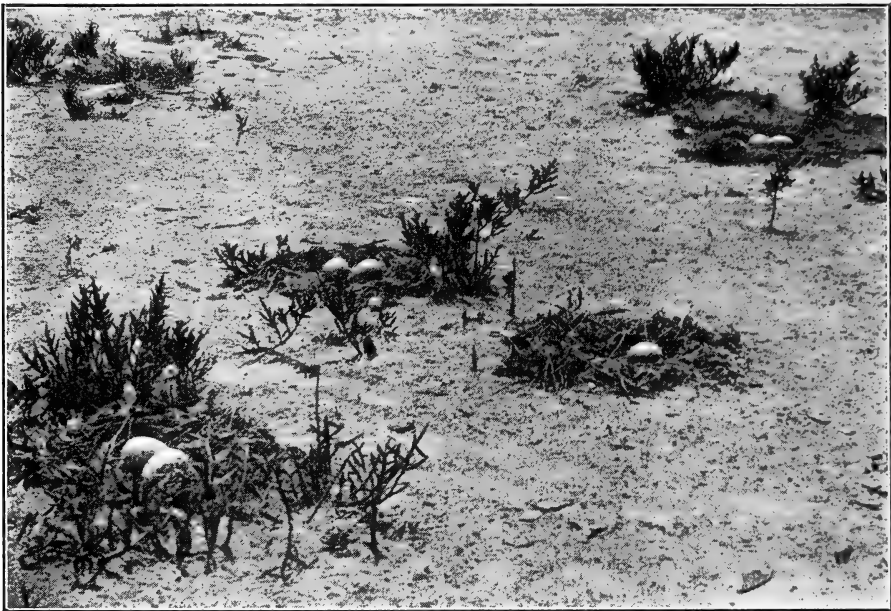


Fig. 16. PART OF THE CASPIAN TERN COLONY. CAMERON COUNTY, TEXAS.

of the bird which renders it quite distinctive to my ear. Bent describes this cry as *katydid-katydid*, and that seems to me to be a perfect rendition. The Gull-billed does not return to its nest as quickly as the Common, but beats in haphazard fashion back and forth before finally dropping. The Common Tern, quite the opposite, returns quickly to its eggs after completing its furious attacks on the intruder. The Gull-billed forages farther from home than any of the other terns. I saw individuals at Brownsville, a distance of fourteen miles, catching minnows and carrying them unswallowed back in the direction of the colony.

The eggs of the Gull-billed Tern present more variation than those of the other small terns. The usual type is a light brownish, well spotted with darker brown, the spots being large. Then there is a light bluish-gray shell with very dark brown spots; and the rarest type has a gray shell beautifully marked with



chocolate spots and blotches, and resembles eggs of the Sharp-shinned Hawk to some extent.

The Common Tern was found to nest only on the two mud islands. It was present in enormous numbers also, several thousand would be quite conservative. It selected for its nesting site the more thickly-grown grassy areas, and while it nested in some cases inside the Gull-billed area, the main colony was entirely separated from the latter. The nests were distinctively better built than those of the Gull-billed, with more grass, less mud, and a more neatly shaped cup for the eggs. Usually the nest was sheltered on one side by a sprig of salt grass. Nesting had evidently commenced simultaneously with the Gull-billed, for on May 16 all nests contained eggs and quite a few small downy young were found. The young of this species were similar in appearance to those of the Gull-billed.

Eggs were found to vary in color less than in the Gull-billed. The usual type was a greenish-olive shell with brownish and blackish spots. Some tended



Fig. 17. NEST AND SMALL YOUNG OF THE CASPIAN TERN. CAMERON COUNTY, TEXAS.

Photo by Robert Runyon.

toward a totally brown shell and some were nearly blue. The egg is smaller than that of the Gull-billed, more slender though nearly as long. All nests contained either two or three eggs and none with four were found.

We found the Common Tern to be the most pugnacious, determined and persistent fighter of them all. On the wing it was more agile and graceful, with perhaps more speed than the other small terns. It swoops closer to one's head, cries louder and oftener, and attracts more attention than the others. It also goes to the other extreme, however, in sinking more quickly and quietly to the nest, following the attack on the intruder.

Forster Tern was present in very limited numbers, perhaps less than 100. It associated with the Common Tern more than with the Gull-billed. I found the red bill to be the easiest distinguishing character in this bird. It was found nesting in an area between the main colonies of the Gull-billed and Common on the southern mud island. The nests were like those of the Common in being well built, but the bird had evidently commenced nesting later, because all eggs were fresh on May 16 and no young birds were seen. All nests contained



three eggs, and the eggs were distinguished from those of the Common Tern by the depth of green color and the numerous small black markings. This species is less demonstrative than either the Gull-billed or the Common Tern. Its voice resembles somewhat that of the Common but can easily be distinguished from it. This point marks the southern limit of the breeding range of this species.

The Least Tern was present in large numbers on two islands, the western and the northern. Why it was not present on the southern is a question, but I assume it to be because of the presence there of the vicious Caspian Tern, which here took the "place in the sun" usually occupied by some gull in other water-bird colonies. This little tern nested in a peculiar manner, all nests being strung out in a ragged line following a line of flotsam of all descriptions demarking a former high water. This line was perhaps thirty-five feet from the shore. The nests were about twenty-five feet apart and consisted solely in a slight depression in the earth which had been worn by the bird in its frequent turnings. A few had meager ornamentation in the form of some bits of broken shells placed near the nest but not arranged concentrically about it. On May

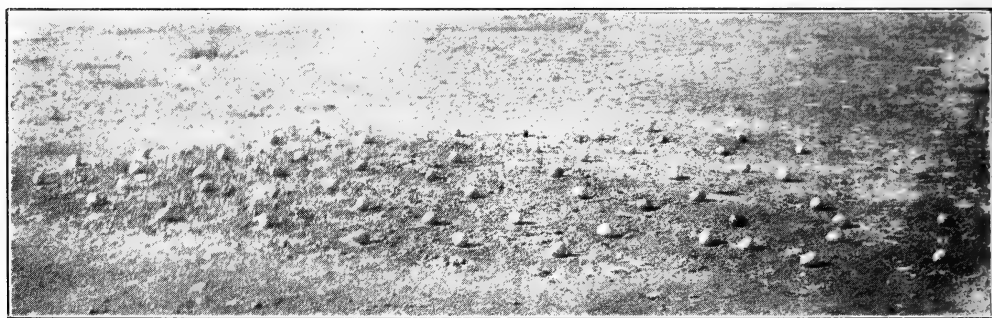


Fig. 18. EGG FIELD OF THE ROYAL AND CABOT TERNS, EGGS OF THE LATTER BEING ON THE FAR SIDE AND TO THE RIGHT OF CENTER LINE. NO EGGS OF THE CABOT TERN INSIDE THE ROYAL TERN FIELD.

16 every nest contained two eggs nearly fresh. On the 23rd no young had yet appeared, but on June 5 Mr. Camp found a few small downy young.

The Least Tern is quite alert when on the nest, leaving it to fly at the intruder long before he is near the nest. At the first cry of alarm all the terns leave their nests and flock about the cause of the disturbance; but they shortly fly back to watch over their own eggs, indicating by their hovering where their nest is. Attacks are made at one's head by the owners of the nearest nest only, adjacent nest owners taking up the fight where the others leave off, as one walks along through the colony. This bird does not like to be looked at and will maneuver so as to get in the rear before making its furious dash at one's head. The male of this graceful species has a habit of bringing small fish to the female. The male alights on the sand at some slight distance from the female and walks slowly toward her. When he reaches her he shows the fish and then encircles her several times, gently teasing her, but finally presents it to her. I saw this performance many times and never tired of watching it.

The Caspian Terns occupied only the southern mud shoal island. There were probably less than 100 pairs. They occupied a distinct area, a rather

bare strip parallel to the shore and about fifty feet from it. Nests were strung out in a loosely bound group and averaged about ten feet apart. Nests of no other species were to be found within that area. Some nests were very well made, consisting of mounds of grass and mud, well shaped, and dished at the top for the eggs. They were not high but gave the appearance of solidity and permanence. Others, especially some found by Mr. Camp on June 5, were no nests at all, the eggs being laid on the bare earth. These may well have been second layings of birds whose eggs were taken on our visits on May 16 and 23. On May 16 no young had yet appeared, although some eggs were quite well incubated. On the 23rd no young were noted, though some eggs were very far gone in incubation. On June 5 Mr. Camp found some small downy young. Most of the nests contained two eggs, but some sets of three were found.

The Caspian Tern leaves its nest silently and retires to a discreet distance, from which it then watches the intruder. It was in no case found to make any demonstration or false attack on us. Its voice is a harsh *caarr* having some of the guttural quality of the squawk of the Night Heron. Caspian Terns keep to themselves in well formed flocks when not on the nests, and they apparently



Fig. 19. ROYAL AND CABOT TERNS GUARDING THEIR EGGS. SOME OF THE CABOTS ARE SITTING BUT NONE OF THE ROYALS ARE. SAME LOCATION AS THAT SHOWN IN FIGURE 18. CAMERON COUNTY, TEXAS, MAY 16, 1921.

do not associate at all with their cousins, the Royal Terns. They are more wary than the Royal also, and good photographs could not be secured by the direct approach method.

Eggs of the Caspian Tern were found not to vary greatly. In size, shape and general type they were all the same. The ground color is dull olive gray with some life to it, the spots small, scattered and of a darker brown or lavender brown. One set has a coffee brown ground color and the markings are slender lines rather than spots, but that set is unique.

This was the only species which made any pretense of attacking its neighbors. Caspian Terns were seen time and again to dash at small downy young of the Gull-billed Tern which were running frantically across the flats away from us, snap them across the neck, back, or top of the head with the heavy bill, and leave the youngster a quivering mass, no longer a live tern. Of the two large terns, the Royal has more the look of a pirate, but apparently it is very peaceful, and, judging from its fraternal attitude toward the Cabot Tern, is the direct opposite in temperament to the Caspian.

The Royal Tern, with its satellite the Cabot Tern, was found nesting only

on the southern shoal. There were two separate egg-fields some 100 feet apart. The larger of the two was closer to the Caspian colony than any other, while the smaller was rather close to a part of the Gull-billed main colony. Each of these egg-field colonies had twenty-five pairs of Royal and fifteen pairs of Cabot terns, approximately. After seeing the laboriously constructed nests of such birds as the Verdin, the Golden-fronted Woodpecker (which in this country hews out its home from the tough pine telephone poles), and the Cactus Wren, one wonders at the reason for it all when the Royal Tern is seen to do quite as well in producing its progeny by the simple matter of laying its egg wherever it happens to be sitting last! All the eggs, as shown in the photograph, lay at an average distance apart of about eighteen inches, just a comfortable distance. The eggs of the Royal formed one continuous field, with those of the Cabot adjoining it to one side with no break in the continuity. When resting on the eggs the birds faced east and a majority of the eggs pointed west, that is, the large end toward the east. When this closely con-



Fig. 20. THE CABOT TERNS ALLOWED OF CLOSER APPROACH DIRECTLY THAN DID ANY OF THE OTHER SPECIES.

gested colony was approached the birds raised themselves to their feet and stood, wings fluttering, crying at the tops of their voices. The Royals left the ground first when I was at a distance of seventy-five feet, but the Cabots stuck to their posts until I was closer than fifty feet. While looking the eggs over, the birds hovered overhead but made no attacks like the Common and Least terns. Very shortly after I left the egg-field the Cabots dropped onto their eggs, the Royals following soon after. All found their individual eggs with no fuss or fighting. Bent in his "Life Histories" speaks of these two species as the Damon and Pythias of the bird world and the comparison is admirable. The two species stick closely together even when on the wing, but the Royal seems to be the leader.

The eggs of the Royal Tern vary little in shape and size but in markings a great deal. Some eggs have a creamy brown shell, well spotted and blotched with dark greenish black, while others are spotless white with fine specks uni-

formly distributed over the entire shell. Only one set of two eggs was found and this may have been an accidental fusion of two adjoining nests.

The voice of the Royal Tern was not in quality distinguishable to me from that of the Caspian, being a loud, harsh, guttural *caaar*, but, as Bent says, pitched slightly higher.

On both May 16 and 23, eggs were for the most part, fresh or but slightly incubated, but on June 5 Mr. Camp found a few small downy young. Nesting must commence at the same time as with the Caspian and Cabot terns; possibly the Forster and Least should be included here too. The Gull-billed and Common get several days start on all the others.

The eggs of the Cabot Tern are to me the most beautiful of all water birds' eggs, and some of them rival the most handsome raptorial products. The variation is extensive. The ground color ranges from a beautiful, fresh salmon with a peach-like bloom to it, to pure white, and then to a peculiar greenish white, a ghastly white might be better. The markings range in size from small specks to large blotches covering a large portion of the shell, in color from



Fig. 21. BLACK SKIMMERS AND GULL-BILLED TERNS NEAR THEIR NESTS. CAMERON COUNTY, TEXAS. Photo by Robert Runyon.

brilliant black to chocolate and magenta. There is in some markings an opalescent quality, I mean a hint of several colors combined in the one as in the opal. It was a great temptation to take every Cabot Tern egg on the island, but one's blowing capacity is limited! With the exception of two sets of two eggs, all the Cabots laid a single egg. In one of the cases of two eggs I believe two singles were mixed, because the degree of incubation was very different in the two eggs, and they did not greatly resemble each other either.

The Cabot Tern has a decidedly distinctive cry, at least when excited. It is a loud *kirhitt-kirhitt*, according to Bent, and I agree with him exactly. There is a great deal of chuckling when the birds settle on the eggs after being disturbed.

Aside from the terns, several other kinds of birds were found nesting on the islands, and of these the Black Skimmer (*Rhynchops nigra*) was the most conspicuous. On May 16 they were pairing and scratching about in the earth of the western island. On the 23rd we found perhaps twenty-five nests, all containing eggs but none with the full set of four. On June 5, Mr. Camp found all the nests to contain four eggs. The Skimmers by their many peculiar

habits furnish enough material for a separate paper and I can not go into their ways here. Their nests were arranged in a row following the line of high water flotsam, as in the Least Tern, and consisted in a simple scoop in the earth made by the many wiggings of the bird when sitting.

On May 16 I found a nest of the Avocet (*Recurvirostra americana*) with four eggs ready to hatch, and this constitutes one of the most interesting breeding records for this group of islands. It has been reported as breeding once at Corpus Christi long ago; but Gulf Coast records are very scarce, for this is fully 500 miles south of the normal southern limit. Only a single pair of birds was seen and the nest was found by watching the supposed female return to the nest following a great broken-wing demonstration, which indicated plainly the presence of eggs or young birds. Mr. Camp took a second set of Avocet eggs on June 5, and I assume that they were a second laying of the same pair of birds.



Fig. 22. THE BLACK SKIMMERS FLEW UP AND DOWN THE BEACH AS LONG AS WE WERE NEAR THEIR NESTS.

Wilson Plovers (*Ochthodromus wilsonius*) were fairly common, but though evidently breeding, only one nest with two eggs was found. Mr. Kirn got this set. The nest was fairly well hidden under salt grass and located well inland from the shore of the northern mud shoal. Western Willets (*Catoptrophorus semipalmatus inornatus*) were numerous but no nests could be located. One brood of small young was found. Long-billed Curlews (*Numenius americanus*) were common on the mainland but not much in evidence on these small islands. Other water birds which visited the islands but which were not breeding there were the Roseate Spoonbill (*Ajaia ajaja*), Mexican Cormorant (*Phalacrocorax vigua mexicanus*), Reddish Egret (*Dichromanassa rufescens*), Louisiana Heron (*Hydranassa tricolor ruficollis*), Ward Heron (*Ardea herodias wardi*), and many small sandpipers which were undoubtedly migrants.

The only land bird in evidence was the Texas Horned Lark (*Otocoris alpestris giraudi*). This species evidently never strays out of sight of salt water



Fig. 23. NEST AND EGGS OF THE BLACK SKIMMER. CAMERON COUNTY, TEXAS, JUNE  
5, 1921.

Photo by Robert Runyon.



Fig. 24. NEST AND EGGS OF THE AVOCET. CAMERON COUNTY, TEXAS, MAY 16, 1921.



of this Gulf Coast. I did not note it outside the limits of the salt marshes. Its nests close to water, in fact four out of six nests found were on small islands and within twenty-five feet of water. Mr. Kirn found a nest with a full set of three eggs on one of these mud shoals. The nests are different from those of most of the United States horned larks in that feathers are used for lining. In the Canadian forms I believe feathers are usually included, due no doubt to general practice among birds there to circumvent the cold weather. This Texan bird uses the water-washed feathers of small sandpipers and the like, and this practice seems to me to be more instinctive than practical. It is like the use of snake skins in nests of the Crested Flycatcher. The main part of the horned lark nests consisted entirely of a fine ribbon-like sea grass which was washed up in great profusion on the beach. The grass was, of course, bleached until nearly white.

During both our visits in May we did not note any signs of coyotes. This seemed very strange to me, because the animal is really numerous everywhere on the mainland and was seen daily. It would be an easy swim to the islands, and with a great reward at the end. Rapacious birds are almost entirely absent from that region and there are no rodents on the islands. It thus looks as though (aside from minor depredations by visiting oologists, perhaps every ten years) the terns have established themselves in a very well protected breeding ground. Mr. Camp writes me that steps will be taken to officially protect the colony, in addition to the natural protection already existing.

*Tulsa, Oklahoma, January 25, 1922.*

## NOTES ON FOX SPARROWS IN CALIFORNIA IN THE AUTUMN OF 1921

By JOSEPH MAILLIARD\*

THE fall field work for 1921 in the Department of Ornithology of the California Academy of Sciences was so planned as to include further observations upon the fox sparrow group during the southerly flight from the threatening grasp of the northern winter.

As the autumn field work for the two previous seasons, carried on in the area covered by the Inner Coast Range (Condor, xxiii, 1921, p. 178), showed results that were practically similar insofar as concerned the species noted, the scene of activity for the fall of 1921 was shifted to the adjacent coast itself, that is to say, the northwest coast of California. This territory was selected principally, however, because it made possible the combination of fox sparrow work with another scheme which was in reality the main object of the expedition, the results of which will appear later in a separate paper.

It has been discovered that the subspecies of fox sparrow (*Passerella iliaca*) wintering along the coast of California in what is known as the "Humid Coast Belt" differ to a greater or less extent from those found a little farther inland at the same latitudes, but there are no published records of investigations of the conditions existing in the former territory during the migration

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\*Contribution no. 130 from the California Academy of Sciences.



period of early autumn. Hence it seemed advisable to get some idea of what was taking place there at this season of the year. While the other, and main, object of the fall work would interfere with our settling down in any one spot to keep daily watch, the combination of the two schemes seemed most advisable and worked out fairly well.

For this work Mr. Chester C. Lamb, an old member of the Cooper Ornithological Club, desired to accompany me, and he was taken on as temporary assistant, his car of an exceedingly well-known, if often caricatured, make being our means of transportation. Sometimes it transported and sometimes it didn't.

The most northerly objective point was Requa, Del Norte County, California, which was reached on September 15. A stay was made here until September 21, but, much to my surprise, no fox sparrows were seen. I had confidently expected to find the Townsend and Sooty Fox Sparrow scratching away at the edge of the woods or under thick brush, but, although our camp was on the verge of a magnificent redwood forest and near some very good brush cover for this genus, none was discovered.

When we left Requa on the latter date, a sharp watch was kept along the road for sparrows, with the idea that we might camp at any spot where some were met with; but not one was identified as we slowly drove along, although we passed through miles of very good cover, especially near what is known as Big Lagoon, between Trinidad and Orick, Humboldt County.

Having no encouragement to stop on the way, we went on to Eureka to consult with Mr. C. I. Clay, another Cooper Club member, who has been traveling over the roads of Humboldt County for enough years to know every foot of the country where any roads exist. My intention had been to make for the ridges in the vicinity of Bridgeville, on the road from Fortuna to the Sacramento Valley, but Clay thought that this would take us too far inland for our purpose before striking good fox sparrow country; so, instead of following the van Duzen River to Bridgeville, I decided to go to Kneeland Prairie, about fifteen miles southeasterly from Eureka, actual distance, but some twenty-four miles by winding road. On September 22, we went into camp at the extreme easterly end of this "prairie" (all open rolling land, whether at sea level or on top of a mountain is called a "prairie" on the northwest coast), at an elevation of about two thousand feet on the edge of timber and brush land, some four miles south of the Kneeland post office and facing Iaqua Butte. The narrow mountain ranges all through this part of the country have a northwesterly-southeasterly trend, with small rivers lying between them. Hence any birds migrating directly north or south must necessarily cross diagonally over these ranges; or else those following the ranges or valleys between would be diverted into the interior of the state if moving south, or out into the ocean if moving north.

Our camping place was chosen on account of its being where three ravines headed, one running up from the Mad River Valley and two from a small creek flowing into the Eel River system, as well as on account of its being near the lowest saddle in the range for a long distance, consequently the most likely place for birds to cross over from one valley to the other. There was good cover for fox sparrows in this vicinity, although possibly not the most attractive food.

We found these birds very scarce at first, in fact finding none at all on top of the ridges during the first few days of our stay, most of those noted being in the canyons on the Mad River side in partially brushy, cut-over timber. Here we found some signs of scratching along an old wood road. Lamb saw several fox sparrows pretty well down this canyon on the morning of September 23, and of these he obtained one specimen.

The next morning I went down this same canyon along the old wood road and saw five fox sparrows, securing two specimens; but they certainly were not present in any number. Those noted were in a mixed sort of brush consisting of second-growth tan-bark sprouts, mountain mahogany, spiraea, California bay trees, and madrone, with a little wild lilac scattered through it. Lamb found a few of the sparrows down another and lower ridge, scattered along, but there was not much activity in evidence. The 25th was too rainy for us to go into the brush, but on the 26th Lamb ran into quite a number on this same ridge, evidently part of a considerable movement working along singly or in small groups. I tried watching a trail in the brush near the top of this ridge where there seemed to be a likely place, but was rewarded by the sight of only one fox sparrow, the flight evidently passing below me toward the saddle referred to previously.

We stayed at this camp until September 30, noting a few of the sparrows every day but not in any numbers, and concluded that it was getting rather late, judging from former experiences in this line, for any large migrating movement. On this date we moved over to Capetown, near the mouth of the Bear River, about twenty-five miles southwest of Eureka, passing a couple of days encamped in the bed of the river about half a mile from the ocean.

A very steep hillside opposite us was covered with a dense growth of hazel and salmon-berry bushes in which a considerable number of fox sparrows were happily and safely—safely as far as hawks were concerned, at least—ensconced. It was very difficult to do much in this dense brush and, to add to this, the fog and wind threatened to make it still harder to carry on observations here, so we broke camp and moved farther inland to obtain shelter from some protecting ridge interposing between ourselves and the sea.

On October 2 we moved about fifteen miles (bee line) farther south to an attractive spot on the Mattole River, five miles south of Petrolia (Humboldt County), and tarried there to see what we might find. Here again we found fox sparrows enjoying themselves in suitable spots, and of the same subspecies as hitherto noted. Proper food and cover were present and a limited number of specimens was taken. As before remarked, fox sparrows were not the only object of this field work and in fact were secondary, but a good deal of time was devoted to observing them and to getting sufficient specimens for identification, although the primary object interfered with our remaining long enough in any one place to exhaust fox sparrow possibilities.

While we were in Eureka, Clay had told us of a large thorn-covered area near Shelter Cove on the coast, and from his description of it I became anxious to reach this country to see what might be going on there, and concluded to make it our immediate objective while the weather held good. Inquiries along the road elicited the information that there was an old unoccupied cabin in a clearing near the bridge over the Mattole River on the road running from Briceland to Shelter Cove that would do for shelter in case of a storm, and

this we found without difficulty. This cabin was about two miles northwest of what is down on the current maps as Thorn, near the southern boundary of Humboldt County, but which is only a ranch where the Thorn post-office was maintained for a while. The latter has been moved recently to another ranch nearer Shelter Cove.

A large area in the vicinity of our camp was covered with a thick growth of the white thorn, which we found to be a sort of "buck brush" (*Ceanothus incanus*), interspersed in places with "wild coffee" (*Rhamnus californicus*), and "wild lilac" (*Ceanothus thyrsiflorus*). Thorn is only three or four miles from the south boundary of Humboldt County and at this camp we were only six or seven miles from the ocean, but separated from it by quite a high ridge which must cut off a good deal of the usual ocean breeze and accompanying fog, to judge from the appearance of the vegetation. It certainly affected the climate, for we had nipping frost in the morning and high temperature in the afternoon, which is unusual so near to the ocean at this time of year. We made this camp on the afternoon of October 4, in time to get settled and to look around a little before the early dusk of the autumn day.

Before sunrise the next morning we were out looking for fox sparrows and we assuredly found them. There were not so many in the flat surrounding the cabin, although they were fairly numerous even there; but in a narrow canyon near-by there were more individuals than I had ever seen in one place anywhere. In fact, I saw more in the two mornings here than in all my life before and yet I have been making a "hobby" of chasing around after this particular genus for a good many years past.

On the morning of October 5, Lamb was directed to work down the Mattole River to look especially for certain birds in that direction, while I went into the thorn brush to observe the fox sparrows. It turned out, however, that Lamb came across so many small birds in the brush on his way to the river that he did not get any farther, but remained also to note fox sparrows.

For my part I found the thorn brush, especially where the berry or seed bearing bushes were more numerous, swarming with birds of several species, which need not be mentioned here, but among which fox sparrows were largely represented. These latter would come to a squeaking sound (made by myself) from all directions and were remarkably tame. Ordinarily the individuals of this genus are extremely wary, usually alert to dive into the shelter of a bush at the slightest sound or movement on the part of an observer, but here they would come right out on dead branches to within four or five feet of one and look him right in the eye! Even such motion as changing one's position or quietly raising a hand did not seem to startle them.

There were a great many dead limbs among the living brush, as the country appeared to have been burnt over frequently, in all probability to make browse for the goats which are kept there. In spots where the fox sparrows were most numerous it was not unusual to see from half a dozen to twenty-five or thirty of them among the dead branches of a good sized bush after their curiosity had been excited by a succession of "squeaks" on my part.

Although Lamb came across a good many of these birds in the direction in which he went he did not find them so numerous in any one spot as had been my experience in the canyon spoken of above. While there was considerable frost in the early morning at this place the afternoons were actually

hot, and the birds not much in evidence at that period of the day, although Lamb found a spot near the river late one afternoon that had quite a number moving around or feeding in it.

Whether the sparrows we saw on the 4th and 5th of October were migrating or not we could not at first determine, but there did not seem to be anything about their actions that would lead one to conclude that such was the case. In order to determine this better I went on the morning of October 6 to the narrow canyon where the fox sparrows had been so numerous on the preceding day. If none was there the conclusion that they were migrating would naturally be reached. A few "squeaks" from me, however, filled the surrounding bushes with an excited lot of birds eager to find out the cause for this unwonted noise. With a little lining up, from a couple to half a dozen individuals might have been secured at a single shot with my 20-gauge gun, could one have backed far enough away to avoid blowing them to pieces.

In order to see whether the fox sparrows were mostly congregated in this canyon a tour was made, where cattle or goat trails permitted, through the brush on a hillside covering an area of something like half a mile square, and it was found that these sparrows could be "squeaked up" anywhere in this territory, from one or two up to six or eight appearing every time such a trial was made. If a similar condition exists over all the territory covered by the thorn bush in this locality, these birds must have been here in thousands.

Later that morning I went down the river canyon and found fox sparrows scattered all along wherever suitable places occurred. At the same time Lamb went into the brush on another hillside across the river and reported similar conditions there, with "half a dozen fox sparrows around me all the time", as he expressed it. As the large majority of these birds were of the same subspecies not very many were taken, our efforts being principally confined to observation and to securing any individuals that appeared darker or lighter than the others. The thorn bush here bears quantities of small, round seeds about the size of, and somewhat resembling, the hemp seed used as a food for canary birds, and this food appeared to be what attracted such numbers of the sparrows to this locality.

While it would have been advisable to remain here for some time in order to learn more of what the fox sparrows might do, there were weightier reasons for our leaving it, which we did, much to my regret, on the morning of October 7. The only other stop on the way back to San Francisco was made on Rattlesnake Creek, near Cummings P. O., Mendocino County, California, a locality best known today by the presence in the vicinity of an inn, much frequented by automobilists, known as "Twin Rocks Hotel". Our means of transportation acted exceedingly mean and finally ceased to transport, so that here we were laid up for several days for necessary repairs. Although there was a good deal of brush on the hillsides in places and up some of the canyons, we failed to find any traces whatever of fox sparrows in this vicinity and our observations upon that genus were abruptly ended.

No matter at which camp fox sparrows were secured during this trip, they are apparently nearly all of one subspecies. They appear to be practically of the same form as the darkest colored individuals we had taken during the field work of the two previous autumns and which I have placed as the Sooty Fox Sparrow (*Passerella iliaca fuliginosa*), although but few are typical.

Many of the balance apparently show intergradation with other races and are very difficult to place. Swarth, in his "Revision of the Avian Genus *Passerella*" (Univ. Calif. Publ. Zool., vol. 21, 1920, p. 150), says of a number of *P. i. fuliginosa* he had examined: "With the exception of one or two specimens from Humboldt Bay they do not even approach typical *fuliginosa* very closely in appearance; they are placed in that category because their characters are such as to indicate a closer affinity to *fuliginosa* than to any other form, and probably illustrate intergradation between *fuliginosa* and some one of the adjacent subspecies."

In the work just quoted (p. 144) Swarth states that the Townsend Fox Sparrow (*P. i. townsendi*) is abundant near Humboldt Bay (California) in winter, and this statement led me to suppose that we would come across it in numbers. On the contrary, we found this form extremely scarce, securing only four specimens, all females, which could be positively identified as such, and three or four others which appeared to be between *townsendi* and *fuliginosa*. Of the four identified as *townsendi*, two were taken at Capetown, right on the coast; one near Petrolia, a little farther inland; and one at Thorn. Possibly the Townsend Fox Sparrow appears in Humboldt County in greater numbers later on in the winter, lagging behind the other species during the fall migration, or perhaps waiting until heavy storms or lack of food actually force an exodus from its breeding grounds.

Of the thirty-eight specimens taken, only the four mentioned above could be decidedly separated from *fuliginosa*; and but one or two even tend toward the lighter colored, more grayish, yet slender billed races found during the fall migration east of the humid coast belt, and these few cases are not very pronounced.

Representatives of what Swarth terms the "Schistacea group", with the gray or brownish coloration predominating, and a much more stubby bill, among which are the so-called "slate-colored" and "thick-billed" sparrows, were entirely absent from the territory we worked in, although careful watch was maintained for strays of those races. Nor was the "Iliaca group", of bright reddish and clear gray coloration approaching the eastern fox sparrow, met with in a single instance.

This seems to show that while the darker races select the coast territory for the line of flight, some do stray toward the interior, and that no individuals of the other two groups are attracted toward the coast until fairly well south, say, to Sonoma or Marin County.

While the work above outlined has not been sufficiently systematic or long continued to obtain the amount of information upon the subject which it would be desirable to have, it has been sufficiently so to give a good idea of the conditions in the territory covered. With similar fall work in sections farther eastward, which it is hoped will be accomplished in the near future, a good deal more will be added to our meager store of knowledge concerning these groups, and a good working basis established for more detailed operations. It is with the hope of stimulating more widely spread interest in this matter, as much as to give the public the benefit of such observations as it has been in my power to make, that these papers upon fox sparrows are submitted.

*San Francisco, California, January 6, 1922.*

## A STUDY OF ROOSTING HOLES OF THE RED-SHAFTED FLICKER

By EMERSON A. STONER

WITH THREE ILLUSTRATIONS

IN A FAR CORNER of the cemetery in Benicia, California, is a small shack, fourteen by twenty feet, built of redwood and called the "pest house", for the reason that at infrequent intervals some case of small pox is quarantined therein. For several years there has been no occupant, and because the building is not often approached it has resulted that the walls on each of its four sides have been disfigured by the characteristic roosting holes drilled through the one-inch boards by Red-shafted Flickers (*Colaptes cafer collaris*). At the present time there are seven large holes completed or of sufficient size to allow the entrance of the birds, and in addition there are nine smaller excavations the completion of which the birds have either postponed or abandoned.

This is not the only building so perforated by flickers in Benicia, but it may be cited to illustrate this characteristic habit of the western bird, a trait not often shared by the flicker of the eastern states.



Fig. 25. "PEST HOUSE", BENICIA, CALIFORNIA, USED AS A BUNK HOUSE BY RED-SHAFTED FLICKERS.

The common impression of the casual passer-by seems to be that these excavations are made by some woodpecker for nesting purposes. However, it is very evident that they have no connection with nidification, but that the primary object of these excavations is to provide sleeping quarters. I am inclined to believe that there is also at times an element of drilling simply "for the fun of it"; especially does this seem to be the case when a number of holes are made in close proximity to each other and lead to practically the same point in the interior.

Any one of the holes in the building referred to above allows access to the entire interior, which is unlighted except through the excavations made by the bird. From his entrance he may get a "bird's-eye view" of a few pieces of

rough furniture, namely a bed supported by a box at each corner, a small stove, a table and a chair, and a few kitchen utensils. That the bird would be in search of a nesting site in such a situation is quite out of the question. Any support on which the bird might settle himself would be entirely dissimilar to the secure receptacle afforded by the usual cavity excavated by this species in a dead limb for the purpose of laying its eggs. Furthermore, the holes are drilled after the breeding season, in the fall or early winter months. At the present writing a fresh hole is nearly completed in this building. Though it is true our California winters in the Sonoran zones are not severe, *collaris* has no doubt discovered that it is much more comfortable to be indoors, especially on frosty and rainy nights. Any evening at this season a passer-by may frighten several flickers from the holes in the pest house.



Fig. 26. HOLES DUG BY RED-SHAFTED FLICKERS TO OBTAIN SLEEPING QUARTERS.

one by ten inch board encircling the building directly under the projecting roof. In the interior, the top of the window casing offers an immediate roosting place for the bird. This projection is four inches wide and three feet long. It is littered with droppings as is also the floor directly below.

*b.* Four inches by four and one-half inches. This is six inches to the right of *a* and opens up onto the same ledge. A square piece of board has been nailed from the inside in order to cover up this hole, which may account for the two excavations so close together.

*c.* Three inches by two and three-quarters inches. Opening made within

At the approach of the breeding season there is a sudden exodus of flickers from Benicia and the immediate vicinity. This is no doubt due to the scarcity of suitable timber here for their nesting holes. During this season they are usually entirely absent, though in Contra Costa County on the opposite side of the Carquinez Straits, as well as in other sections of the San Francisco Bay region, one may find them breeding quite commonly. Absence of the flicker from our immediate locality during the breeding season is cited as further evidence that the holes made in buildings are not for the purpose of housing the eggs and young.

The dimensions of each of the larger holes in the "pest house" at their greatest diameters, as well as other interesting data in connection with the excavations outlined in the accompanying sketch (see fig. 27), are as follows.

*a.*  $4\frac{1}{2}$  inches by 4 inches. This excavation was made between the top board of the window trimming and cornice, which latter consists of a plain



the angle formed by the junction of the corner board and the cornice. On the inside the surface of the board for some six inches below the cavity has been pecked away for about half its thickness. The projection used by the birds for roosting is forty-two inches below the hole and consists of a three inch brace encircling the building on the interior, to which the side boards are nailed at a point about half-way up from the floor. This projection is littered with droppings for some distance each side of the hole, as is also the floor underneath. On approaching from the outside a person could hear the bird which was using this perch scramble up the inside of the wall to make its exit.

*d.* Two and one-half by five inches. This hole is six feet from the ground alongside the corner-board. The crack in this case is so near the corner-board

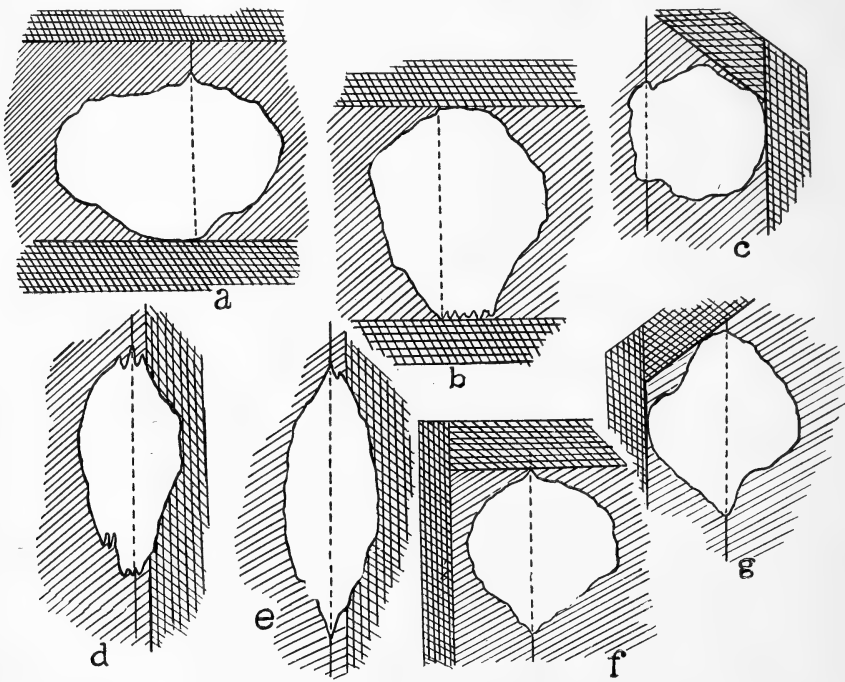


Fig. 27. SKETCHES OF SEVEN ROOSTING HOLES EXCAVATED IN THE "PEST HOUSE", BENICIA, CALIFORNIA, BY RED-SHAFTED FLICKERS. APPROXIMATELY 72 CUBIC INCHES OF WOOD HAD BEEN DISPLACED BY THE BIRDS IN THIS BUILDING.

that it was impossible to widen the hole proportionately in each direction without also attacking that board. This made a two-inch thickness to penetrate and accounts for the fact that the opening is so elongated. The hole opens directly onto a shelf, on which one of the birds roosts alongside a one-gallon oil can. The shelf is covered with droppings of the birds, as is also an up-turned wooden tub on the floor below.

*e.* One and three-quarters by six inches. This opening is eight inches above *d*, and the drop on the inside to the shelf is the same distance. Part of the corner board is chipped off here also. There is no apparent advantage in this opening, as the one below serves the same purpose.

f. Three and one-quarter by three and one-half inches. This opening is in the upper corner of the building, within the angle formed by the corner board and the trimming beneath the roof. The bird using this hole roosts on a two by three inch board forty inches below the hole, as is evidenced by the accumulation of droppings along this board and on the floor directly below.

g. Three and one-quarter by four inches. Between the angle formed by the juncture of the corner-board and the cornice, a similar position to c, on the opposite side of the building. Here a drop of forty-two inches is required to reach the same supporting boards to which more direct access is secured by making entrance through holes d and e.

Observation of these holes discloses the fact that the bird prefers, or more probably requires, a projection or some other foothold to which it may cling while chipping out a hole in a flat surface such as the side of a building. Each of the holes, as well as the incompleated ones not sketched, are drilled close against a board used as trimming (shown in the sketch by heavier shading) which furnishes a support to the prospective lodger. The broken lines drawn through the figures to show location of the joints between the boards would indicate that operations are commenced along this juncture, apparently for the reason that the crack facilitates the beginning of the project, though the boards are tongued and grooved and fit snugly together.

*Benicia, California, January 12, 1922.*

## A LAW GOVERNING THE ELEVATION OF THE NESTING SITE

By CHARLES KETCHUM AVERILL

IN Chapman's "Warblers of North America", particular attention is given to the vertical range in the trees of the arboreal species in their summer homes. Thus, the Cape May "lives in the tops of high coniferous trees". The Blackburn "is a lover of deep mixed growths and the upper branches of the biggest conifers". Other species of the same genus, *Dendroica*, are more lowly in range. The Prairie Warbler keeps near the ground. Of the Chestnut-sided we note that "its beat lies between the ground and the tops of small deciduous trees". In this way we may note the habit of each species and make a list of those that are high ranging and another of those that range low.

From the same source we may learn the nesting height of each species, and place this information opposite each. In the *Auk* (vol. 37, October, 1920, p. 572) I called attention to the fact that as length of wing is a factor in ease and power of flight, and the tail an impediment to flight, the bird with the longer wing and shorter tail might be called the better flier, and species so proportioned were the ones making the longer migrations. Taking the wing and tail lengths from Ridgway's "Birds of North and Middle America", the figures being the average given for the male bird in every case, and subtracting the latter from the former we may complete the table of the genus *Dendroica* by placing the wing and tail difference in a third column.

TABLES SHOWING THE RELATION BETWEEN WING LENGTH AND HEIGHT OF NESTING IN THE GENUS DENDROICA

I. LOW RANGING		
	Nesting height	Wing minus tail mm.
Prairie Warbler	Bushes	9.8
Palm and Yellow Palm Warblers	On or near ground	12.5
Golden-cheeked Warbler	Up to 15 ft.	10.9
Magnolia Warbler	8 to 20 ft., once 35 ft.	11.4
Chestnut-sided Warbler	3 ft.	13.2
Black-throated Blue Warbler	2 ft.	14.1
Kirtland Warbler	On or near the ground	12.6
Average		12.1
II. HIGH RANGING		
	Nesting height	Wing minus tail mm.
Pine Warbler	10 to 80 ft.	18.5
Cerulean Warbler	5 to 50 ft.	20.5
Cape May Warbler	low nesting	19.1
Townsend Warbler	rarely noted, once 4 ft.	17.2
Hermit Warbler	2½ to 45 ft.	15.6
Blackburn Warbler	10 to 40 ft.	19.5
Yellow-throated Warbler	30 to 40 ft.	16.2
Sycamore Warbler	similar to last	15.7
Grace Warbler	50 to 60 ft.	22.0
Bay-breasted Warbler	5 to 20 ft.	20.3
Black-throated Green Warbler	3 to 40 ft.	16.0
Average		18.3

From these tables we learn that to range high and nest high is the prerogative of the long-winged birds. In no case does a short-winged species nest high. That high ranging and high nesting should go together is not surprising, since in feeding the young, the adult birds make so many trips to and from the nest that it is a great economy of time and labor to have the nest and feeding range near the same elevation, just as humans have found the flat more convenient than the storied dwelling.

Why only the longer winged warblers nest high is an interesting question to which it is possible to give an answer worth considering. The farther removed from the ground, the safer the nest and its occupants, so there is an influence toward high nesting. But the leaving of the nest by the young on the first flight is an event of great import attended with considerable danger, and the better flier will be able to leave with greater safety. We have all noticed the excitement in the family when the young bird takes its first flight and no doubt this is caused by the sense of danger. Thus those that build high are the longer-winged birds; but the converse is, of course, not true, as many long-winged birds nest on the ground.

Three long-winged species have been omitted from the table, the Black-poll, Myrtle, and Yellow warblers. These breed across the continent, north to the tree limit, where all trees are low and stunted. A preference for a high nesting site would be incompatible with such a range. Although at the southern limit of the breeding range occasionally a high nest may be found, we should expect as a rule these species to be low nesting, as is the case. The members of the genus *Helminthophila* are ground nesting and are not high

rangers in the breeding season, although they are arboreal. Other warblers nesting in trees are the Parula and Eastern Redstart, but there are not enough species in each genus to interest us. The Olive Warbler of the southwest is a high-nesting bird, thirty to fifty feet, and is decidedly long-winged.

Among the vireos the high rangers are the Red-eyed, Warbling, and Yellow-throated. These also nest high at times, the Red-eyed, five to forty feet, the Warbling, eight to forty feet, the Yellow-throated, ten to thirty feet\*. The White-eyed Vireo and its relatives, being much shorter-winged, live nearer the ground, nesting in thickets. It is not necessary to give figures of wing and tail length as all the members of the genus *Vireo*, to which the White-eyed Vireo belongs, have the rounded form of wing which is shorter always than the pointed wing and indicates poor flight ability, while the Red-eyed, Warbling, and Yellow-throated (genera *Vireosylva* and *Lanivireo*) have pointed wings. The Black-whiskered, Philadelphia, and Solitary vireos are all tree-nesting birds of pointed wing but rather lower in preference of nesting site.

In the finch family all species that range well up in the trees are long-winged. Goldfinch, Purple Finch, Siskin, Redpolls, Crossbills, Rose-breasted Grosbeak and Indigo Bunting all nest above the ground. The Pine Grosbeak, arboreal and nesting off the ground, is one of the long-winged, and the Evening Grosbeak, also long-winged, nests up to twenty feet. In the genus *Spizella*, as is the case with nearly all "sparrows", the nest is on the ground or in a low bush, except that of the Chipping Sparrow, which nests a few feet up and is the longest winged of its kind. It is also less of a ground bird than its relatives. All our North American sparrows are short-winged and therefore low or ground nesting.

The Eastern species of *Icterus* follow the law also, as is seen from the table immediately following.

EASTERN SPECIES OF ORIOLES

	Nesting height	Wing minus tail mm.
Baltimore Oriole	20 to 40 ft.	21.1
Orchard Oriole	10 to 15 ft.	9.0

TYRANT FLYCATCHERS

I. HIGH RANGING

	Nesting height	Wing minus tail mm.
Kingbird	15 to 25 ft.	33.9
Olive-sided Flycatcher	25 ft.	38.0
Wood Pewee	20 to 40 ft.	17.2

Average 29.7

II. LOW RANGING

	Nesting height	Wing minus tail mm.
Phoebe	Low	14.6
Yellow-bellied Flycatcher	On ground	15.1
Acadian Flycatcher	Up to 8 ft.	15.0
Traill Flycatcher	Near the ground	12.7
Least Flycatcher	5 to 15 ft.	9.9

Average 13.4

\*All nesting elevations are from Chapman's "Handbook of Birds of Eastern North America."

## III. HIGH RANGING BUT RATHER LOW NESTING

	Nesting height	Wing minus tail mm.
Great Crested Flycatcher	Generally less than 20 ft.	10.0
THRUSHES NESTING ABOVE GROUND		
Wood Thrush	About 8 ft.	37.5
Gray-cheeked Thrush	Low trees or bushes	31.0
Olive-backed Thrush	About 4 ft.	30.8
	Average	33.1
THRUSHES NESTING ON GROUND		
Hermit Thrush		24.2
Wilson Thrush		27.9
	Average	26.0

Other birds ranging and nesting high are the Tanagers, Cedar Waxwing, Kinglets, Robin (at times), Bluebird, Crows, and Grackles. These are all long and pointed of wing. Apparently the only short and round winged bird in eastern North America to nest high is the Blue-gray Gnatcatcher, ten to sixty feet; this is the only exception to the law.

All our passerine birds that fly at any considerable elevation above the ground have the long, pointed wing, as Grackles, Red-winged Blackbirds, Cowbirds, Rusty Blackbird, Longspurs, Shore Larks, Titlarks, Robin, Kingbirds, Bluebirds, European Starling, Crows, Ravens and, of course, the Swallows. Even such as fly in flocks in the open above the trees are of the same wing form, as Goldfinches, Siskins, Redpolls, Crossbills, Purple Finches, Cedar Waxwing.

To sum up: Birds with long pointed wings may nest high or low, but the short and round winged are low nesting. In short, among groups of similar passerine North American birds the power of flight is closely related to the elevation of the nest in species that are arboreal.

*Bridgeport, Connecticut, January 8, 1922.*

## FROM FIELD AND STUDY

**Red-wings of the Imperial Valley, California.**—During the comparatively few years since agricultural development in the Imperial Valley of California has been in progress, many species of birds have extended their ranges to include this favored area, some have multiplied apace, and not a few of them are, to some extent, changing their habits to conform to new conditions. Chief among these in numbers is probably the Sonora Red-wing (*Agelaius phoeniceus sonoriensis*). Coming in from the valley of the Colorado River, where they were practically limited to the riparian association, the blackbirds have spread over the broad and fertile plain of the Imperial and, fattening unmolested on the grain crops, have become amazingly abundant. There seems to have been little competition in their ecological position, and, with few apparent enemies, their untold thousands have already become such a serious menace that it is being loudly and insistently demanded that some steps be taken to control their depredations.

Red-wings seem to be rather evenly distributed over the valley floor during the

breeding season, as might be expected; for then their diet consists largely of insects, and a given territory will support only a definite number of families. During September and October it is discovered that there has occurred a shifting of the population, and at that time they are not at all common about my ranch near Calexico but are reported as then fairly swarming at the northern end of the valley, where the greatest damage is done to the maturing crop of kaffir corn and milo. The reason for this seasonal shifting is obscure, as those crops are raised to an equal extent at the southern end of the valley, but a significant fact is that a vast area between the irrigated land and the Salton Sea is covered with a wilderness of tules, in which the birds may roost, while at the southern end the tules seem to be limited to a narrow strip along the river.

At about the time that the last of the kaffir corn is being harvested, the red-wings reappear in the vicinity of Calexico in large numbers. There are then no great fields of standing grain in which several thousand birds may sink without a trace; the bulk of the crop has been sacked for export, and what is needed for winter feeding is left "in the head" and placed in piles handy to the feed lot. Obviously, no farmer will view with equanimity the descent upon his corn pile of a couple of thousand red-wings, and law or no law, he will get down his shotgun. Whether from this likely cause or a more obscure one, the birds disperse after the harvest is over and congregate in small flocks, each numbering a few dozen individuals, in the neighborhood of the feed lots, where, with the cowbirds and towhees, they partake of a hearty meal of corn morning and evening, but spend the greater portion of the day about other business.

Whether the red-wings roost to any extent in the river tules near my ranch I am unable to state; but certain it is that they did not do so in the rank patch of this growth, fifty feet square, that formerly filled my horse pond. Rather did they repair for the night with a flock of feral guinea fowl to the protection of a large cottonwood, and during the short time in winter when this is totally without leaves, probably to a row of eucalyptus trees some distance away. During the hottest part of the day, they are in the habit of gathering in an exceedingly garrulous assemblage in the top of a cottonwood or other shady tree; or, as often, I have seen a flock of several hundred taking their siestas strung along the ground beneath the arrow-weed growing on a big ditch bank.

At the Colorado River, in January of 1913, I examined many old red-wing nests situated in tules, which latter, as far as I observed, were always growing in little sloughs that were partly shaded by willows, and hence the nests were protected from the full force of the spring sun during at least a part of the day. I know of no such associational conditions in the Imperial Valley, and the tules along the New River are unshaded. Although these grow in a particularly dense tangle, certain it is that the red-wings do not nest in this situation near my ranch. As the birds were particularly common, I was at a loss to discover just where they do nest, until May 6, when A. van Rossem noted several carrying nesting material into a cottonwood fully sixty feet above the ground; and we subsequently found that a considerable number had taken up their abode in this lone tree. The inference is that if the birds had at any time begun to nest in their usual tule location, they were speedily forced to change their abodes; for I am firmly convinced that unless they nested close to the ground, where they would be subject to the depredations of foraging raccoons and skunks, the intense fervor of the Imperial sun would be too much for them. Hence, the logical alternative would be the cooler protection of the cottonwood.

On the economic status of the red-wings of this district I am unqualified to speak. Their food must be secured with unusually slight effort, for in a large proportion of individuals, the culmen is found to project considerably beyond the gonys, sometimes to a marked extent, and this condition is caused by the lack of the wear and tear usually encountered in gaining a livelihood. It cannot be gainsaid that these birds do an enormous amount of damage at certain seasons in certain districts, and that controlling measures will probably have to be adopted. But a word should be said in their defense. The yellow alfalfa butterfly is a serious pest, and I strongly suspect that when a flock of a hundred of the black fellows wheels over a field and settles into the waving alfalfa, the birds are seeking the festive caterpillar.—A. BRAZIER HOWELL, *Pasadena, California, December 1, 1921.*

**Slight Extension of the Breeding Range of the Western Lark Sparrow.**—As Lark Sparrows (*Chondestes grammacus strigatus*) are supposed to occupy the desert regions only in winter (Pacific Coast Avifauna no. 11, p. 116), it may be worth while to note that the species is a common breeder on the Mohave Desert, from Palmdale to at least twenty miles east of that point. Over this region, which lies along the desert base of the San Gabriel Range, their occurrence is general and not confined, as one might expect, to cultivated areas. While perhaps slightly more common in the pear and other deciduous orchards, they are nevertheless distributed over the unsettled country as well. Many pairs were seen daily from May 3 to May 14, 1920, and were equally common in the same locality during late April and early May of the present year. One nest containing five apparently fresh eggs was found May 5, 1920. It was built on the ground under a small dense bush in the yucca-juniper association at considerable distance from the nearest tilled land.—D. R. DICKEY AND A. J. VAN ROSSEM, *Pasadena, California, December 5, 1921.*

**Albino Robin Returning to Former Nesting Site.**—The following note is offered as a modest contribution to the mass of published data in support of the theory that birds return to a particular nesting site. A male robin showing patches of white on the wings and predominantly white on the under parts returned for three consecutive years to a garden in Summerland, British Columbia, where, each year, he acquired a mate and helped raise the ensuing family. His piebald appearance made him an object of suspicion to his brethren of conventional garb, and the garden witnessed frequent battles, from which he usually emerged victorious. He was known in the neighborhood as "Blewitt's white robin", and his non-appearance on the fourth year caused general regret in the little community. But four years would appear to be a relatively long span of life for a conspicuous albino.—J. A. MUNRO, *Okanagan Landing, British Columbia, November 26, 1921.*

**Vermilion Flycatcher and Red Phalarope at Long Beach, California.**—I wish to report the Vermilion Flycatcher (*Pyrocephalus rubinus mexicanus*) from the vicinity of Long Beach. I first saw the bird (a male) on November 20, and I saw it again on December 14. Some friends saw it December 11 and again December 17. Evidently just the one bird has taken up its abode there for the winter. Every time observed it has been within a radius of one-fourth mile. The habitat chosen is a slough with a few scattering willows and a few tules. For the most part the bird was observed perched on the top branches of willows but occasionally upon a fence post or tule. It displayed the usual flycatcher mannerisms by flying out, snapping up an insect, and then returning to the place from which it came.

There was an unusual migration of Red Phalaropes (*Phalaropus fulicarius*) this past fall. I saw about three hundred within an hour on the ponds of the Long Beach Salt Works. This was October 30. There was a great mortality among them this year. Dead birds were brought to the schools picked up by children in the streets or elsewhere. On the ponds mentioned above, dead birds were washed up in windrows. I could count nineteen from one position and twenty-one from another. I counted seventy-five within half an hour. The birds had no shot holes in them, and showed no external evidences of having flown against wires, but all the birds examined were emaciated in the extreme.—L. W. WELCH, *Long Beach, California, December 24, 1921.*

**Sonoma Thrasher in Humboldt County, California.**—While I was camping last October (1921) in company with Mr. Chester C. Lamb, near what is down on the current maps as "Thorn", a few miles north of the southern boundary of Humboldt County, it was a matter of surprise to us to hear the notes of thrashers among the thick growth of white thorn (*Ceanothus incanus*) surrounding our camp. This was situated only six or seven miles from the ocean shore, about east of the landing called Shelter Cove, and somewhat protected from ocean winds by a range of hills. These birds were very shy but we succeeded in securing three specimens on October 5 and 6, only one of which, however, had completely assumed the new fall plumage. These specimens appear to



be inseparable from *Toxostoma redivivum sonomae*. This is a more northern coast record than has so far been published, according to my recollection.

Another specimen of this species was secured near Cummings P. O., Mendocino County (California), and more were heard, but this locality is farther south and much more inland than Thorn, but not much farther north than Covelo, from which a record has been published.—JOSEPH MAILLIARD, *California Academy of Sciences, San Francisco, California, January 12, 1922.*

**Breeding of the San Diego Titmouse on the Mohave Desert.**—April 12 of the present year, the junior writer collected a pair of San Diego Titmouses (*Baeolophus inornatus murinus*), five miles east of Palmdale, in the yucca-juniper association. The female had apparently laid but a short time previously, and there was undoubtedly a nest near at hand. Another pair was heard (but not taken) a few hundred yards away. These two birds are most like *murinus*, but are not typical of that form. They are grayer dorsally, and the wing of the male measures longer than that of any coast slope bird we have. These differences possibly indicate a tendency toward *griseus*.—D. R. DICKEY AND A. J. VAN ROSSEM, *Pasadena, California, December 5, 1921.*

**A December Record for the Sage Thrasher in Colorado.**—On December 8, 1921, we collected a female *Oreoscoptes montanus* on the College campus at Fort Collins. The bird was in good flesh, and its stomach contained two small pebbles and remains of twenty-one flies (*Anocompta latiuscula*).—W. L. BURNETT, *Colorado State Agricultural College, Fort Collins, January 1, 1922.*

**The Bathing of Hummingbirds.**—From the scarcity of published references to the bathing of hummingbirds, one is led to believe that these birds are not generally aware of the benefits to be derived from an occasional bath. I have seen hummingbirds bathe so many times that I have considered it a rather commonplace occurrence, though none the less interesting, and while reading a recent paper by John Burroughs (Harper's Magazine, May, 1921, p. 789), I was somewhat startled by the statement that "This morning I saw a hummingbird taking its bath in the big dewdrops on a small ash tree. I have seen other birds bathe in the dew or raindrops on tree foliage, but did not before know that the hummer bathed at all." This refers of course to the Ruby-throated Hummingbird (*Archilochus colubris*) and it may be that that bird seldom bathes, else so careful and experienced an observer would have seen it long ago. Mr. H. W. Bates in "A Naturalist on the Amazon" described hummingbirds as bathing by dipping into a pool of water while on the wing. This also probably refers to birds unknown in California.

During the past five or six years, I have, several times each spring, visited a little glen in Golden Gate Park, San Francisco, in which at one place the water flows about a quarter of an inch deep over the flat surface of a rock. This rock has been appropriated by the Allen Hummingbirds (*Selasphorus alleni*) for a bathing place. The place at times was fairly swarming with the birds and the constant hum might lead one to believe that a nest of huge bumble bees had been disturbed. Suddenly with a buzz a bird would appear, hover over the rock for an instant, and then sprawl headlong into the water, stretching the wings and neck and lying prone on the rock, squirming the body and fluttering the wings until seemingly it became quite "water-logged". Then, just as suddenly, it would dart to a perch overhead, leaving a streak of mist in its wake like the tail of a miniature comet. Here it would preen its plumage. The surface of the rock was not over a foot across and I noted as many as four birds bathing simultaneously. Occasionally, after preening, one would return for a second dip.

Again on August 18, 1921, in Alameda, the Anna Hummingbird (*Calypte anna*) treated me to a rare performance somewhat similar to that mentioned by Mr. Burroughs. I had been sprinkling the garden when a male bird came to the rose bushes and literally sprawled on the wet foliage. For several minutes he crawled among the leaves, wiping the sides of his head, spreading the wings and tail, and mopping up as much water as possible, appearing ridiculously like a tiny parrot climbing about its cage. Following this he flew to a clothes line and preened his plumage. The garden sprink-

ler was turned on but he did not fly through the spray as I have heard hummingbirds will do.

That hummingbirds bathe, and quite thoroughly, then, is certain, despite the scarcity of references. No doubt they enjoy the bath as well as other birds, but the ease with which they penetrate thickets and cover distances has enabled them to escape observation.—FRANK N. BASSETT, *Alameda, California, January 21, 1922.*

**Notes on Some Water-fowl.**—Regarding the nesting of the Canvasback (*Marila valisineria*), I have on two occasions caught young ones, nearly full-grown, in New Mexico, where I believe they nest in considerable numbers in the mountain lakes. Half a dozen pairs used to breed every year on a prairie pond on the C. S. Ranch, the property of Mr. Charles Springer, near Cimarron, Colfax County, New Mexico. I found them there last in 1915. In California, the southward migration of Canvasbacks leaves the coast at about the latitude of San Luis Obispo, and from that point follows the mountain lakes south. Many of them winter in the lakes of the San Pedro Martir Mountains, Lower California, but one never sees them on either coast of the Peninsula. The records of a club like the Bolsa Chica show how rare the "Cans" are along the southern coast of California, and yet on the grounds of the San Timoteo Gun Club, near Banning, Riverside County, one used to bag two Cans for one of every other kind of bird!

I once handled two fine specimens of the Black Brant (*Branta nigricans*) that were shot by a friend on a reservoir near Redlands in 1903. They were members of a flock of about a dozen, and I remember my surprise at seeing this strictly maritime species so far from the sea. I question whether the numbers of these birds have been so greatly diminished by shooting. They still winter in vast numbers on San Quentin Bay, Lower California, where the few gunners who have sought them have had no difficulty in making disgracefully huge bags. Perhaps the brant have learned to avoid our coast entirely, and pass by each year, in scarcely diminished numbers, to winter on the Mexican bays, where the report of a shotgun is seldom or never heard.

I believe that changing conditions, brought about by the deplorable influx of settlers into California, lead one to think that the fowl have decreased more than is perhaps the case—though Heaven knows the decrease is pitiful enough. In 1919, when I spent a few months at home, I found that dozens of ponds and lakes formerly alive with waterfowl, were deserted. Were the birds nearly all dead, or had they changed their wintering places? The geese are gone, like the cranes which, less than twenty years ago, used to pass in thousands over Riverside and San Bernardino counties, migrating northward from the Colorado delta. But concerning the ducks, I am not so sure. There are at present in California two great wintering regions for countless myriads of wild duck: the Sacramento Valley about Colusa, and the Imperial Valley in the south. The number of fowl concentrated in these two regions is staggering to the imagination. Only two years ago I sat in a blind near Gridley and forgot to use my gun while I watched tens of thousands of sprig trailing like films of lace across the sky. I believe that in an hour not less than a quarter of a million birds passed southward. The rice plantations of this region account, in part at least, for the desertion of other parts of the valley; the great irrigated areas of Imperial, with the tule swamps where the New River runs into the Salton Sea, seem to me to account for much of the desertion of once populous waters in southern California. A generation ago ducks were almost unknown in the Imperial district. If Imperial were suddenly to go dry, and all the birds wintering there to scatter out, as formerly, over the lakes and marshes of southern California, the prospect might look less depressing.

The fresh water marshes of Lake Chapala, in the state of Jalisco, Mexico, form another haven for waterfowl. At one end of the lake there is a great area of flooded land cut by a veritable labyrinth of sluggish channels, 400 square miles, I should say. The far interior of this swampy paradise, reached after three days' travel in a native canoe, is a vast sanctuary for wildfowl, a region of gently-rolling damp prairies, set with small ponds, and traversed by a network of navigable channels leading to the great lake. I saw as many geese, White-fronted (*Anser albifrons*) and Snow (*Chen hyperboreus*), as I have ever seen in the Sacramento Valley, and the number of ducks was past belief, with some interesting species, like the Masked and Florida Black or Dusky, to

lend variety. A more thorough investigation of this field would be worth while, for I have reason to believe that several species of northern ducks breed there, and breed at a much later season than in our country. On November 20 (1909) I found a brood of young Shovellers (*Spatula clypeata*) unable to fly, and the natives told me that hundreds of ducks nested there, among them Gadwall, Dusky, Sprig, Shoveller, and Cinnamon Teal.

The South Pacific, where I am living now, is a poor place from the point of view of a lover of the Anatidae. We have only one duck in the islands south of the Line (though I know a man who claims that Shovellers come to Penrhyn Island every year about Thanksgiving time, and remain for two or three months), called *Anas superciliosa*, and reminding one of a small dull-colored Gadwall. Three migrating waders reach Tahiti every year from the north: The Pacific Golden Plover (*Charadrius dominicus fulvus*), the Wandering Tattler (*Heteractitis incanus*), and the Bristle-thighed Curlew (*Numenius tahitiensis*).—C. B. NORDHOFF, *Papeete, Tahiti, Society Islands, November 22, 1921.*

**Second Occurrence of the Yakutat Song Sparrow in California.**—On September 19, 1915, Mr. Laurence M. Huey took a specimen of *Melospiza melodia caurina* Ridgway, at Fortuna, Humboldt County, California. The bird is a female (no. C 281, coll. Donald R. Dickey), and becomes, I believe, the second recorded instance of the capture within the state of this rare winter visitant to the northwest coast of California.

The bird was taken on a brushy hillside in the immediate vicinity of Fortuna, and at a distance, therefore, of several miles from the sea. In this connection, it is interesting to note the wide departure from normal in the associational behavior exhibited during migration by this individual. In its breeding range and on its winter ground the bird is essentially a "beach-comber". This has been clearly indicated by the single winter capture heretofore recorded for California (Grinnell, Condor, XII, 1910, p. 174), and by the Oregon experience of Shelton (Condor, XVII, 1915, p. 60), and the Alaskan notes from Admiralty Island given by H. S. Swarth (Condor, XIV, 1912, p. 73). Here, on the contrary, it was found far inland in the characteristic habitat of the host of Townsend Fox Sparrows that were coming in at the time from the north, and in an association quite distinct from that of the beach.

Dr. Joseph Grinnell and Mr. H. S. Swarth have kindly compared the specimen with the birds from more northern stations that are now in their care at the Museum of Vertebrate Zoology, Berkeley, California.—DONALD R. DICKEY, *Pasadena, California, December 22, 1921.*

**Rufous Hummingbird Tragedy.**—On April 24, 1920, Mrs. Stoner found in the back yard a male Rufous Hummingbird (*Selasphorus rufus*), badly stunned and fluttering on the ground beneath the clothesline, with which no doubt it had collided. The line was one of the continuous wire lines working on a pulley at each end, and quite possibly in trying to avoid one of the wires it flew into the other, some ten or twelve inches above or below. It was taken into the house, but lived only a few minutes. The outer tail feathers measure 3 mm. in width, and the next to middle tail feathers are notched. The skin was preserved. This incident cites a date of the northward migration in this locality, as well as one of the many hazards birds have to contend with.—EMERSON A. STONER, *Benicia, California, December 31, 1921.*

**Wintering of the Nuttall Sparrow in Los Angeles County.**—Because of the paucity of records of this species from Los Angeles County, California, it may be of interest to note that this sparrow was found to be fairly common in Placerita Canyon, near Newhall, during December, 1920, and January, 1921.

Mr. E. J. Brown and the junior writer spent several odd days collecting in this locality with the following results: December 15, 1920, we took four adult specimens of *Zonotrichia leucophrys nuttalli* and saw several more at sufficiently close range to make us fairly sure that they were of the same form; December 30, 1920, we took three additional adults and saw what we were confident were two more; January 24, 1921, we took another adult.

All of these birds were either in the typical "song sparrow" cover of a damp willow bottom, or among the blackberry vines of a ranch garden.—D. R. DICKEY AND A. J. VAN ROSSEM, *Pasadena, California, January 13, 1922.*

**Kamchatka Sea Eagle at Kodiak, Alaska.**—The accompanying photograph is of the Kamchatka Sea Eagle (*Thalassoaetus pelagicus*), which was taken last summer on the island of Kodiak, Alaska, by a party of which I was a member. The capture was made August 10, 1921, at the outlet of a small lake without name, which is tributary to the upper end of Karluk Lake. The photograph was taken from the outlet stream, looking lengthwise of the smaller lake, which is about two miles long.

The bird was shot by a native who formed a member of our party, and who frequently hunts about Karluk Lake. He stated that he had observed this strange eagle



Fig. 28. KAMCHATKA SEA EAGLE CAPTURED ON KODIAK ISLAND, ALASKA, AUGUST 10, 1921.

on a number of previous occasions and had tried to capture it, and that this was the only bird of the kind he had ever seen. Bald Eagles were abundant in this locality.

My few notes state that the head was not white but was covered with feathers variegated much as in the Golden Eagle. The tail and leg feathers were white, as were the entire front edges of the wings. The feet and bill were extremely powerful, obviously larger than in the Bald Eagle, which we had for comparison. Both bill and feet were strikingly bright in color, of a deep golden yellow, which covered also the bare portion of the legs. The tail feathers were graduated.—CHARLES H. GILBERT, *Stanford University, California, January 20, 1922.*

**Red Phalarope in Southern California.**—At the October meeting of the Southern Division of the Cooper Club comment was made on the numbers of Red Phalaropes (*Phalaropus fulicarius*) dying on the beach. Several persons reported the birds also inland. On October 25 I saw twelve on a flooded meadow in Los Angeles on South Main Street near Manchester Avenue. At Wilmington tide flats, October 22, several flocks of twelve or more birds each were closely observed for several hours altogether. During the whole day only three or four bodies were found, although one sick bird was picked

up. Two birds shot from tide pools had so much fat I had to scrape the skins, but the others were thin.

Between October 3 and November 28, I visited the flats at San Pedro or the rocks at Point Fermin nine times. At all times when found the birds were actively whirling in pools or flitting and dabbling about on the ocean. Besides those mentioned I have found only a few carcasses.

August 23 and several days thereafter I observed a lone Red Phalarope very closely. When first encountered the bird was making short flights along the beach to dodge a small child who persistently trotted after it from place to place. Finally it took refuge on the water. In a few moments, after preening and resting, it returned and trotted easily and fearlessly before my slow advance, flying only when frightened and then but a rod or so, or out to the water. Kelp flies seemed to satisfy its sporting instincts and hunger, and the bird stalked them slowly and pointedly one by one. With bill and neck outstretched and lowered in line with a fly on the sand, a slow advance was made until with a pounce the hunt closed. If the fly escaped, the phalarope sometimes ran after it, bill out.

Another pose interested me. On finding a kelp mass decaying and drawing flies, the Phalarope approached closely and so low that his breast touched the ground, but the rear of the bird was high up. At times he would remain with breast down and pick at the flies much as a dusting fowl picks up a stray grain. Mr. L. E. Wyman reported similar "breast to ground" actions of two phalaropes he saw feeding by a kelp mass on the beach.

Upon the arrival of the Red Phalaropes, a local paper stated that the harbor was covered with "Mother Cary's Chickens".—ROLAND C. ROSS, *Los Angeles, California, January 2, 1922.*

**New Nesting Records of American Osprey in Northern California.**—As nesting records of the American Osprey (*Pandion haliaetus carolinensis*) in the northern part of this state are rather rare it was interesting to note two nests during 1921.

One of these was under construction in the top of the tall stump of a dead fir in a cleared flat on the north side of the Klamath River, near Requa, Del Norte County, California, on May 18. The birds were seen bringing material for building purposes.

The other record is of an Osprey's nest noted on the South Fork of the Eel River some miles above Garberville, Mendocino County, California.

This nest was noted by Mr. Chester C. Lamb and myself on October 7, 1921, as we were returning from a fall field trip up the coast. It was placed on top of a tall, slim, rather isolated redwood tree standing on the edge of the river, and was in plain sight from the highway, but some half a mile distant therefrom. While no birds were seen, it was unmistakably the nest of an Osprey. My brother, John W. Mailliard, had also noted this nest as he passed by a few days previously.—JOSEPH MAILLIARD, *California Academy of Sciences, San Francisco, California, January 12, 1922.*

**Kern County Notes.**—Field work carried on during the last two years in the vicinity of Buena Vista Lake, Kern County, California, has resulted in an extension of the ranges of several birds. Not only has the Suisun Marsh Wren been found breeding about the Lake, but an interesting arm of Mohave influence has been indicated by the presence in the locality of birds that were formerly restricted, in our belief, to the more eastern desert regions.

*Telmatodytes palustris aestuarinus*: A series of breeding marsh wrens taken in the tules about the shores of Buena Vista Lake were identified by Mr. H. S. Swarth as of this form. This extends the breeding range of this comparatively new race south to include the entire San Joaquin Valley.

*Amphispiza nevadensis canescens*: In our experience, this species has never before been found in summer save in the *Artemisia* association. Despite the absence of sage about this Lake, however, this is one of the commonest summer birds, adhering closely to the scrubby growth of *Atriplex polycarpa* which covers the hillsides and plains of the region.

*Bubo virginianus pallascens*: A pair of breeding birds and one juvenile taken by the authors on June 4, 1920, another juvenile taken June 22, 1921, the remains of an

adult bird found by the junior author on September 15, 1921, and a late fall specimen collected by L. M. Huey on October 21, 1919, agree in showing conclusively that the desert race of horned owl is the form found in the extreme southern San Joaquin Valley. Whether *palescens* has invaded the region in recent years and supplanted *pacificus*, which was formerly supposed to inhabit the section, or whether it has always been an established part of the local avifauna, is a debatable question. But the latter hypothesis seems much the more logical when we consider that this region also supports other typical desert forms, such as the Leconte Thrasher and California Sage Sparrow.

*Otocoris alpestris ammophila*: The horned larks breeding about Buena Vista Lake exhibit affinities that are distinctly analogous to those which characterize the horned owls of the region, in that they seem related to the form of the Mohave Desert, rather than to *actia* of the more northern portion of the San Joaquin. A series of breeding birds from the vicinity of the Lake do, in a few instances, show a slight tendency in the latter direction, but the great majority are so close to typical *ammophila* as to be referable with certainty to that form. Breeding birds from Corcoran, Kings County, California, in the collection of A. B. Howell, are unqualifiedly *actia*, so that *ammophila*, in the San Joaquin, must be confined to the extreme southern end of the Valley.—D. R. DICKEY AND A. J. VAN ROSSEM, *Pasadena, California, January 13, 1922.*

**Position of Feet in Flight in Certain Birds.**—Here are several apparent "rules" in bird life that have interested me for some time, and they are passed on to the readers of THE CONDOR for what they are worth.

1. All water birds in flight extend the feet behind.
2. All web-footed birds, with short tails, spread the toes in flight, the membranes apparently acting as an elevator or rudder. This group includes the murre, murrelets, auks, and puffins.

3. All perching birds in flight fold the legs forward under the feathers.

All the short-tailed, web-footed birds that I have had under close observation, when getting under way do spread the toes, placing them side by side to form a wide flat surface, which is no doubt useful in flight. By the time these birds may have attained their regular speed, possibly the toes are relaxed, but they are then as a rule too far distant for accurate observation. I am not so certain that loons follow this rule. Grebes, which are lobe-footed, spread the lobe flat out in rising from the water, and, I think, close the toes after attaining full speed.—GEO. G. CANTWELL, *Puyallup, Washington, January 20, 1922.*

**Further Remarks on the Occurrence of the Buffle-head at Eagle Lake.**—We have read with interest Mr. Allan Brooks's comment on our record of the occurrence of the Buffle-head at Eagle Lake, California. Mr. Ray had received a similar letter from Mr. A. C. Bent drawing his attention particularly to the error in the identification of the young ducks shown in figure 33 of the Condor for November, 1921. It is evident that these are young American Mergansers. We do not wish to take up space unnecessarily in a discussion of this matter, but we believe a further account of the circumstances may be of interest, especially so, as Mr. Brooks has brought up several questions of doubt regarding the identity of the young following the female Buffle-head and also the actions of the male bird.

Mr. Ray and I feel positive that the young following the female are Buffle-heads and we can also vouch for the actions of the male Buffle-head. The error regarding the young ducks shown in figure 33, we believe, should and can be explained by the circumstances leading to their capture. Upon our first encountering the female and eight young, we recognized this as a new breeding duck for this locality and during our efforts to obtain a photograph it was noted that two of the young made several attempts at diving and in this way became separated from the parent. The remaining six kept well up with the parent and seemed to obey each warning. The diving efforts of the two young and the maneuvering of our boat caused a complete separation of the two from the parent and the remainder of the flock.

Several hours afterward, the two young of the photograph were found on the shore of the bay in which the female and young were encountered and not more than 50 yards from the point where the photograph, figure 32, was taken.

As the sizes of the young were apparently the same and no other duck with young was seen in the vicinity, we naturally assumed these were the missing two from the flock. After photographing, we returned these two to the small pond occupied by the female and it was noted that the female immediately began pecking at the two new arrivals. Upon a later observation of the group, we found that the female had only six young, instead of eight, she evidently having driven the two young away from the flock.

At least two explanations are possible regarding the occurrence of these two small young. They may have been separated from their own brood and joined the flock in which we found them, or it is possible Merganser eggs were deposited in the nest of the Buffle-head and hatched. The latter explanation seems the more probable to us on account of the juveniles corresponding in size with the others. It is not uncommon to find eggs of different varieties of ground-nesting ducks in the same nest and, no doubt, the same holds true of tree-nesting varieties as well.

Regarding the occurrence of the male Buffle-head, this bird was flushed from the bay before we were aware of the presence of the female and young. The male returned and was flushed at least twice thereafter from this small bay, and while he showed no particular solicitation for the young, it seemed obvious that he was the parent bird. In any event, he showed a decided preference for the small section of water occupied by the female and young.—JULES LABARTHE, *San Francisco, February 6, 1922.*

## EDITORIAL NOTES AND NEWS

The award of the Brewster Memorial Medal for 1920-21 has been made by the American Ornithologists' Union to Robert Ridgway in recognition of his successful labors on the "Birds of North and Middle America." Every ornithologist will heartily approve of the decision of the committee in charge of the award, that volume VIII of this great work was the most meritorious publication on the birds of America which appeared during the last two-year period.

On January 17, 1922, in response to an invitation from Mr. Charles L. Whittle, Mr. L. B. Fletcher, and others interested in the banding of birds, over 100 persons met at the Boston Society of Natural History Building in Boston and organized a new ornithological society to be known as the New England Bird Banding Association. The meeting was addressed by Mr. S. Prentiss Baldwin, of Cleveland, who during the last six years, by introducing bird-trapping as a means of banding birds, has done so much to show the scientific possibilities of the work. The Bureau of Biological Survey was represented by Mr. E. A. Goldman who spoke of the Bureau's plans in connection with the movement, strongly endorsing the organization of the new association and recommending the formation of other organizations of the same character at appropriate localities in the United States and Canada. Over 300 members are already enrolled in the new organization.

It is becoming increasingly incumbent upon active workers in any field of science to keep up with the times. Each one of us must know the literature appearing in his field. An indispensable aid to every serious

worker is the Zoological Record, published by the Zoological Society of London (Regent's Park). Mr. W. L. Sclater is editor of the "Aves" portion, the annual subscription to which is seven shillings six pence. The publication of the Zoological Record has been continuous throughout the war period, owing to local provision. But now, with greatly increased printing costs, it can be continued on the same plane of completeness only with outside support as well. It is a coöperative enterprise; hence the propriety of this suggestion that each Condor reader who is also a serious student in ornithology contribute to its maintenance by subscribing, at least to the extent intimated above.

The department of zoology of the Field Museum of Natural History, Chicago, has been completely reorganized under the direction of Dr. Wilfred H. Osgood, Curator of that department. In the division of birds, Dr. C. E. Hellmayr has been secured as Associate Curator, Mr. John T. Zimmer as Assistant Curator, Mr. Colin Sanborn as Assistant, and Mr. Boardman Conover as Associate. In the division of birds' eggs Mr. R. M. Barnes is Assistant Curator. In the division of mammals Mr. Edmund Heller has been made Assistant Curator. Messrs. Heller and Zimmer are about to leave for an extended period of vertebrate collecting in Peru.

Mr. A. S. Kibbe has recently made some comments in *The Gull* (organ of the Audubon Association of the Pacific) anent bird trapping and banding which to our minds deserve serious consideration. He says: "Trapping is not a diversion nor a spas-



modic pastime, but a business, with well defined duties and responsibilities. A bird trap must not be used like a mouse trap, to be baited and set and left to itself until one happens to think of it again. Bird traps should be open to constant observation and must be visited regularly and frequently, because: (1) birds of certain species will not submit to the trap but will kill themselves in efforts to escape; (2) birds that do not object to the confinement may nevertheless quarrel and injure or kill each other; (3) birds that you wish to protect and save may be killed by the other birds or by rats trapped with them; (4) birds are liable to be killed by exposure in traps overnight. . . . Trap and band, if you are competent and willing and able to do it properly; . . . but do not, yourself, nor permit anyone else to, bring terror or destruction to those birds that our Association is pledged to protect."

### COMMUNICATION

#### THE BIOLOGICAL SURVEY BIRD COUNTS

To the Editor of THE CONDOR:

The Biological Survey began in 1914 to collect data on the numerical distribution of bird life in the United States. By such information, which is gained through counts made by volunteer collaborators, of the birds breeding on selected areas, it is possible to gain some knowledge of the yearly fluctuations in bird life and of the effect the present State and Federal laws may have on the increase of game and insectivorous birds. During the earlier years we received a very gratifying response to our request for assistance, but during the war many persons were unable to continue the work and interest in it has seemed to wane. It is desirable that these counts should be repeated on a large scale through a period of years in order that adequate data may be accumulated to make possible definite conclusions. Any one thoroughly familiar with the breeding birds of his vicinity can do this work, and will find it growing in interest from year to year. We are therefore again appealing to the readers of THE CONDOR in the hope that all who are able to do so will make one or more bird counts this summer.

The general plan of this work is to select a tract of land containing from 40 to 80 acres and representing as nearly as possible the average conditions for the vicinity. Some day, during the height of the breeding season, this land should be carefully gone over in the early morning and the male birds counted, which at that season are usu-

ally in full song and may be considered each to represent a breeding pair. The result of this count should be checked subsequently to be sure that all birds counted nest within the selected area, and that none have been missed. The count should not be made until the spring migration is over and the birds are settled on their nesting grounds. In the latitude of Washington, D. C., the best time for the first count is about the first of June; in New England and the northern states probably about June 10; and south of Washington, during the latter part of May.

Anyone who is willing to do this work is requested to send his name and address to the Biological Survey, Washington, D. C. Full directions for making a count and report blanks will be sent in time for plans to be made before the actual time for the field work. Since the Bureau has no funds with which to pay for this work, it must depend on the services of voluntary observers.

An added impetus should be given to this work at the present time by the report that the British ornithologists are contemplating a census of the birds of the British Isles, planned along the same lines as our own.

Very truly yours,

E. W. NELSON,  
CHIEF, BIOLOGICAL SURVEY, Washington,  
D. C., February 1, 1922.

### MINUTES OF COOPER CLUB MEETINGS

#### SOUTHERN DIVISION

OCTOBER.—The regular monthly meeting of the Southern Division, Cooper Ornithological Club, was held at the Los Angeles Museum at 8 P. M., October 27, 1921. President Dickey was in the chair, with others present as follows: Messrs. Appleton, Barnes, Brown, Chambers, Hanaford, Howell, Lamb, Little, Miller, Pierce, Rich, van Rossem, Taylor, Warmer, Wyman; Mesdames Hall, Schneider and Warmer, and Misses Beers, Burnell, Germain and Kennedy. Mrs. Beers, Mrs. van Rossem and Miss Martin were visitors.

Minutes of September meeting were read and approved. The following new names were presented: Benjamin W. King, Coeur d'Alene, Idaho, by H. J. Rust; Mabel M. Lawrence, Los Angeles, by Wright M. Pierce; Harry Rae Van Cleve, Los Angeles, by Dr. Warmer; James Norris Proctor, Santa Paula, by J. O. Snyder; Mrs. Aurelia B. Ferguson, Los Angeles, by Mrs. Bicknell. The Northern Division sent the name of Mrs. Sara S. Boyle, Berkeley.

Business Manager Chambers announced

the appointment of the secretary as deputy-custodian of the Chambliss Library, property of the Southern Division, and located in the Los Angeles Museum.

The occurrence of the red phalarope, in remarkable numbers, even in our city parks, was commented upon at length. Attention was then centered upon a tray of woodpecker skins, following a brief introductory talk by the secretary. Adjourned.—L. E. WYMAN, *Secretary*.

NOVEMBER.—The regular monthly meeting of the Cooper Ornithological Club, Southern Division, was held at the Los Angeles Museum at 8 P. M., November 22, 1921. President Dickey held the chair, with twenty-five members present, as follows: Messrs. Appleton, Chambers, Hanaford, Howard, Howell, Lamb, Low, Miller, Morcom, Pierce, Reis, Rich, Robertson, Ross, van Rossem, Warmer and Wyman; Mesdames Brown, Law and Warmer, and Misses Burnell, Kennedy, Potter and Pratt. Among the visitors were Mrs. Howell, Mrs. van Rossem and Miss Wetherell.

Reading and approval of minutes of the October meeting preceded presentation of the following new names: Miss Mabel A. Stanford, Claremont, by Wright M. Pierce; Willard Fordyce Grinnell, Berkeley, by J. E. Law; Alice M. Huddleston, Berkeley, by Mr. W. L. Chambers; Howard H. Cleaves, by Carroll DeW. Scott; Clinton G. Abbott, and A. W. Anthony, by Mr. Chambers, the three last mentioned of the Natural History Museum, Balboa Park, San Diego. Names from the Northern Division were: Harry P. Stow, Alameda; Frederick C. Torrey, Berkeley; Zola Zinn, Seattle, Wash., and Dr. Robert Dill, Reno, Nevada.

A letter from the secretary of the Pacific Division, American Association for the Advancement of Science, suggesting Salt Lake City as the place for the next annual meeting, was read by the Secretary. On motion of Mr. Robertson the suggestion was approved. Mr. Law presented a resumé of the business managers' report for 1920 and first half of 1921. This showed a very satisfactory state of finances.

Announcement was made by the secretary that Mr. Howell had been appointed assistant business manager, with the title "Endowment Secretary", his special duties being to solicit contributions to the endowment fund and to otherwise promote that branch of the Club's activities.

An interesting paper on the Thick-billed Parrot in Arizona was then presented by

Mr. Law, followed by informal discussion and inspection of a tray of orioles and grackles. Adjourned.—L. E. WYMAN, *Secretary*.

DECEMBER.—The regular monthly meeting of the Southern Division, Cooper Ornithological Club, was held at 8 P. M., December 22, 1921, at the Los Angeles Museum, with President Dickey in the chair and other members present as follows: Messrs. Bishop, Howell, Huey, Law, Little, Nokes, Pierce, van Rossem, Wyman; and Mrs. Law. Minutes of the November meeting were read and approved followed by reading of November minutes of the Northern Division.

New names presented were: Dorothy Sanderson, Los Angeles, and Mrs. A. H. Haynes, St. Paul, Minn., by Mr. Dickey; and Mrs. Arthur J. Mix, Los Angeles, by Mrs. Schneider.

Nomination of officers for 1922 was then taken up. For president, Mr. Howell named Dr. G. C. Rich, seconded by Mr. van Rossem, with nominations closed on the motion of Mr. Little, seconded by Mr. Pierce. The nomination of Mr. Pierce for vice-president by Mr. Law was seconded by Mr. Howell, and nomination closed on motion of Dr. Nokes, seconded by Mr. Little. The incumbent secretary was nominated by Mr. Pierce to succeed himself; seconded by Mr. Law; nominations closed on motion of Dr. Nokes, seconded by Mr. Huey.

A well-prepared paper on certain aspects of evolution was then presented by Mr. Howell, followed by general discussion of the subject. The meeting closed with inspection of a series of loons and grèbes. Adjourned.—L. E. WYMAN, *Secretary*.

JANUARY.—The regular monthly meeting of the Southern Division, Cooper Ornithological Club, was held at the Los Angeles Museum at 8 P. M., January 26, 1922, with Vice-President Pierce in the chair and others present as follows: Messrs. Appleton, Barnes, Bishop, Bramkamp, Brown, Chambers, Huey, King, Law, Lamb, Little, Miller, Morcom, Nokes, Dr. Rich, Selwyn Rich, Warmer and Wyman; Mesdames Anthony, Hall, Law and Schneider; Miss Burnell and Miss Terry. Among visitors were Mrs. Bishop, Mrs. Raymond, Prof. Monroe, Dr. Hall and Dr. Bramkamp.

Minutes of December meeting were read and approved. New names were presented as follows: Elmer Wachtel, Pasadena, by H. Arden Edwards; Ross McKinnon, Blue Rapids, Kansas, by P. B. Peabody; Ralph B. Williams, San Ysidro Ranch, Santa Barbara,

by W. Lee Chambers; Mrs. May Canfield, San Diego, by Laurence M. Huey; Miss Elizabeth Dewees, Norristown, Pa., by R. J. Middleton; Alex Strauss, Banning, by Dick Bramkamp; Rev. Francis M. Wilson, Beaumont, by Walter B. Barrows; Thos. L. Green, Hollywood, by J. E. Law; Mrs. E. M. B. Reichberger, American Museum of Natural History, New York, by W. DeW. Miller; F. C. Millard, Alhambra, by F. H. Hands; Clarence L. Whittle, Boston, Mass., by J. Grinnell; James Olin Wanzer, Sacramento, by W. Lee Chambers. Also from the Northern Division: Miss Matilda V. Nienburg, Alameda; Paul Fredericks Bunker, Berkeley; Emily D. Laloge, Alameda; Dr. G. Dallas Hanna, San Francisco; Leonarde Keeler, Berkeley; Miss W. C. Lindemann, Alameda.

In the matter of election of officers, Dr. Warmer moved that the secretary be instructed to cast an electing ballot for all nominees; seconded by Mr. Huey, and unanimously carried, whereupon the secretary announced Dr. Rich elected president, W. M. Pierce, vice president, and L. E. Wyman, secretary. President Rich took the chair.

Dr. Bishop then spoke on birds of the Great Salt Lake region, illustrating his talk by specimens taken by him in that locality. Followed the usual round of informal discussion of bird matters, with inspection of Dr. Bishop's specimens. Adjourned.—L. E. WYMAN, *Secretary*.

#### NORTHERN DIVISION

DECEMBER.—The December meeting of the Northern Division of the Cooper Ornithological Club was held at the usual place on December 22, at 8 P. M. President Wright presided, and those in attendance were: Mesdames Allen, Kelly, Reygadas and Thomson; Messrs. Bassett, Bryant, Bunker, Dixon, Evermann, Gignoux, Labarthe, Miller, Storer, Stow, Swarth, Torrey and Wadsworth. Visitors: Mrs. Bunker, Mrs. Evermann, Mrs. Thomson, Mrs. Wadsworth, Mr. Keeler, Mr. Kessel and Professor Kingsley.

The November minutes of the Northern Division were read and approved, and the October and November minutes of the Southern Division were read. The following names were proposed: Leonarde Keeler, Berkeley, by Mr. Curtis Wright; Miss W. C. Lindemann, Alameda, and Miss Matilda V. Nienburg, Alameda, by Mrs. G. E. Kelly. Announcement was made of the appointment of Mr. A. B. Howell as a third business manager, to have charge of the endowment fund. Mr. Swarth gave a resumé of the business

managers' reports for January and July, 1921.

Nominations for officers for the coming year resulted in the presentation of the following names to be voted on at the January meeting: For president, H. S. Swarth; for vice-president, J. S. Cooper; for secretary, Mrs. J. T. Allen. Further nominations were closed by unanimous vote.

Business completed, Dr. H. C. Bryant presented a "Field Key for California Hawks". After discussion the meeting adjourned.—AMELIA S. ALLEN, *Secretary*.

JANUARY.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology on January 26, 1922, at 8 P. M. President Wright was in the chair, and about sixty members and friends were present.

After the minutes of the preceding meeting had been read and approved, officers for the ensuing year were elected as follows: President, H. S. Swarth; Vice-President, J. S. Cooper; Secretary, Mrs. J. T. Allen. Mr. Swarth then took the chair and called on Mr. Charles Keeler for the program of the evening—a talk on "The Evolution of the Colors of Birds".

Two new names were proposed for membership by Mr. H. W. Carriger: Mr. John L. Cole, and Mr. Martin C. Paulson, Nevada, Iowa. The following resolution was submitted by Dr. Joseph Grinnell, who moved its adoption. Upon second by Mr. Lastreto it was unanimously adopted by the Club.

Whereas, it is rumored that the Regents of the University of California are seriously considering the use of Strawberry Canyon as a site for the proposed stadium, and

Whereas, Strawberry Canyon comprises a part of the Campus in which animal life native to the region is continuing under as nearly natural conditions as seem possible anywhere in the east-bay region, and

Whereas, Strawberry Canyon is a valuable asset for field instruction in general biology in certain authorized courses of the University of California and also serves in similar manner all local students of birds and of general natural history,

Be it resolved that the Northern Division of the Cooper Ornithological Club protest emphatically against any move contemplated by the Regents of the University of California which would mean the destruction of Strawberry Canyon as regards the values here emphasized.

On motion of Mr. Lastreto, duly seconded, a committee of two was appointed to investigate legislation pending with regard to the sale of foreign bird-feathers. Adjourned.—AMELIA S. ALLEN, *Secretary*.

# THE CONDOR

A Bi-Monthly Magazine of  
Western Ornithology

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Volume XXIV

May-June, 1922

Number 3

[Issued June 10, 1922]

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## MISCELLANEOUS BIRD NOTES FROM MONTANA

By CHARLES L. WHITTLE

WITH TWO ILLUSTRATIONS

**D**URING the spring of 1921, from May 14 to June 5, the writer was occasionally afield in the vicinity of Great Falls, Montana, and much more extensively so in the Little Belt Mountains, about fifty-five miles southeasterly from that city. Great Falls is situated on the Missouri River where the stream debouches from the Rocky Mountains into a broad, inter-mountain valley, at this point approximately 3300 feet above the sea. The valley bottom is treeless except along water courses, and a considerable portion of it is under cultivation.

The section of the mountains visited lay on and near the head-waters of two or three small torrential streams flowing into Belt Creek near Neihart; in particular, Carpenter Creek, which drains the north slope of "Neihart Baldy", a mountain about 8000 feet high. Barring narrow strips along streams occupied by a small deciduous growth, and occasional "mountain parks", this area is almost completely covered with lodge-pole pines, nearly all ten to twenty years old, in most places replacing an older growth of heavy timber of the same species, largely destroyed by fire.

Much of this mountain country was still covered with snow on May 14, and on June 5 snow was still present as drifts on northerly slopes of peaks and ridges occurring at elevations of over 7000 feet. The region visited during this period has an elevation ranging from 5500 to 7300 feet. My visit was therefore fortunate in the matters of time of year and snow conditions, to witness the gradual coming of the birds that visit these somewhat isolated mountains for nesting purposes or pass through them in migration.

Such notes as follow were made incidentally, in connection with other field work in the region mentioned above, and are given in part to show arrival dates for some species and the breeding distribution of others as affected by elevation. The order given follows the American Ornithologists' Union *Check-List*, third edition.

**Actitis macularia.** Spotted Sandpiper. Two seen near Neihart at a small pond on Belt Creek, May 29, at an elevation of 5700 feet. Here a courtship performance was witnessed. One of the birds, judged to be a male, was seen standing on a long, inclined timber, while another, presumed to be a female, red close by along the shore. The male first walked the length of the timber and then flew to another one, where he depressed and spread his tail, and, without teetering, stalked slowly along its entire length, with head bent low. Quiet-water shores are favored by this species and there are accordingly few that summer along this turbulent stream.

**Ceryle alcyon.** Belted Kingfisher. Just one seen, May 18, on Carpenter Creek near a beaver dam. The species is scarce here in summer on account of lack of suitable fishing grounds.

**Dryobates villosus monticola.** Rocky Mountain Hairy Woodpecker. A pair was encountered at 7200 feet in a stand of dead timber. The race was readily recognized by its unspotted wing coverts and tertials. Birds were courting. I watched one preen its feathers for some five minutes while standing vertically on a tree trunk, and it did a very thorough job, most of the back, tail, wings and under parts being gone over, the throat and head receiving a vigorous scratching in lieu of treatment with the mandibles.

**Phalaenoptilus nuttalli nuttalli.** Poor-will. Two were met with on May 26, in small, thickly-growing pines at an elevation of 6800 feet. No doubt just arrived.

**Tyrannus tyrannus.** Kingbird. First one seen June 5, in Missouri River valley near Great Falls. This species was not found above 3400 feet and was confined to rather open country near wooded streams.

**Cyanocitta stelleri annectens.** Black-headed Jay. Identification was based on the published range of this race. Found on May 14 in small lodge-pole pines at an elevation of 5400 feet, probably nesting. Its squeal, like the Red-tailed Hawk, deceived me completely. As I entered the pinery the jay, presumably a male, flew about very excitedly uttering a variety of reproachful notes and among them was the cry of the Red-tail. I could not help wondering if, as is generally believed, this cry is really an imitation of the hawk's, whether it were not being used in an attempt to drive me away as a presumed enemy in hopes of saving its nest from attack, the jays having learned by experience that some of their enemies, such as the pine squirrel, when about to rob their nests, are occasionally frightened away or captured by this hawk.

**Icterus bullocki.** Bullock Oriole. A mated pair seen June 5 in Great Falls Park, the male in first nuptial plumage. Not present here June 1.

**Carpodacus cassinii.** Cassin Purple Finch. Observed range from 5600 to 7300 feet. Not yet nesting (June 1). Abundant.

**Junco hyemalis mearnsi.** Pink-sided Junco. From May 18 to June 4 found ranging from 5600 to 7300 feet. Not yet nesting. Very plentiful.

**Melospiza lincolni lincolni.** Lincoln Sparrow. One male arrived May 26. Sang for hours from a group of small aspens at an elevation of 6000 feet. Appeared to have selected his nesting area.

**Calamospiza melanocorys.** Lark Bunting. This species arrived in the Missouri valley between Great Falls and the village of Belt on May 17, in large flocks composed of both sexes in nuptial plumage. The birds generally remained in flocks at least up to the first of June.

On May 31 as I left the train at Gerber, which is merely a junction point in the Missouri valley (elevation 3376 feet) at 4 P. M., during a slight drizzle, I was welcomed by (to me) an unusual bird chorus, a veritable carnival of song. Western Robins, Red-winged Blackbirds (presumably *Agelaius phoeniceus fortis*), and Western Meadowlarks sang from telegraph poles, the fence posts were capped by singing Western Vesper Sparrows and Song Sparrows, while all about the station in every direction, first here and then there, often in a dozen places at once, Lark Buntings shot into the air, usually from the ground, as though propelled from guns, pouring out the most infectious and passionate song, perhaps, sung by any bird in the United States. This song is far from simple and its opening alto notes give it a noticeable richness. Within one hundred feet of the station on this occasion there were at least a hundred singing males, and with them there were, no doubt, a similar number of silent and inconspicuous females feeding on the ground. If the females were impressed by the singing, or were even aware of it, their behavior did not indicate it.

In one weedy field I counted twenty singing males. They sing while resting on the ground, on weeds, or on fence posts, but commonly the song begins as a bird leaves the ground, moving directly upward at an angle of about 50° to a height of ten to thirty feet and occasionally higher. The descent is slower, usually indirect and more gradual, the song culminating as the bird again comes to rest on the ground or on a fence post. The flight song appears not to differ from the perch song except in the matter of speed, the former being given more rapidly. Very frequently these flights, which are doubtless courtship performances, are accompanied by unusual wing motions. Sometimes the wings are set at the apex of the flight and are often upturned over the back in an acute V, after the habit of McCown Longspurs, with which the Lark Buntings are often associated during such exhibitions, the wings being slowly lowered as they glide or float to the ground. At other times, in place of setting the wings, the birds fly downward, the wing strokes not being perfectly synchronized, giving the birds a rocking motion. This alternation of wing strokes, which is only practised during flight singing, is often at a maximum, namely, when one wing is at the top of its describing arc and the other is at the bottom of its arc. J. A. Allen (in Coues, Birds of the Northwest, p. 164) has apparently called attention to a phase of this phenomenon, describing it as a "peculiar flapping of the wings," and Dr. Townsend (Auk, vol. 29, 1912, p. 286) points out that the Chimney Swift regularly flies in this manner, and that some very young birds (nestlings), crows and grackles being examples, swim by alternate wing strokes if placed in water. The explanation is given that this method of propulsion is primitive, and, according to evolutionary law, is still exhibited by very young birds of many species.

F. H. Allen (Auk, vol. 36, 1919, pp. 528-536) has advanced the theory that the ecstatic mating song is an elaborated older song, one which has been evolved from the perch song. Nevertheless flight songs often contain even more primitive sounds, such as call notes, and it is interesting to note that alternate wing motion in birds, which is a survival of the alternate leg motion of their reptilian ancestors, is still occasionally practiced by Lark Buntings during their flight singing.

The Lark Bunting's song, in common with that of most birds, has been

variously described, but not all such differences in descriptions are due to the personal equation, for birds have an exasperating way of singing unusual songs to the confusion of the bird student. J. A. Allen (Bull. Mus. Comp. Zool., vol. 3, 1871-76, p. 137) says of this species: "Its notes are so similar to those of the Chat (*Icteria v. virens*) as to be scarcely distinguishable from them." I did not observe this similarity, my note book reading: "Their song begins with rich, low, whistled notes followed by trills and other whistled notes, higher-pitched than the opening ones, very similar to certain portions of a Canary's song, alternating with other notes suggesting the bubbling song of the Long-billed Marsh Wren and ending as the bird alights, with a fine trill of an exceedingly high pitch."

As I have stated, this species arrived in flocks on May 17 and the birds were still in flocks on June 1, but by June 5 the dispersal to their nesting areas had taken place. Allen (*loc. cit.*, p. 137) noted that they appeared to nest in colonies about Fort Hays, Kansas. Around Great Falls this tendency was marked, five or six pairs nesting so near together that the males often sang from a series of fence posts at the same time.

The species nested rather locally all over this section of the Missouri valley, up to, but not in, the wooded foothills of the Rockies (elevation approximately 3600 feet). They are birds of the open prairie, selecting nesting sites in weedy tracts, under thick cover of tumble weed (*Cycloloma atriplicifolium*) accumulated by the wind against some obstruction, usually a wire fence, or even under a single plant of this species over-turned on the prairie. Nest-building begins during the last days of May, and a completed nest was found on June 1 which contained three eggs on June 4. This nest was built entirely of grass and, as is customary, was placed on the ground with its rim flush with the surface, the inside diameter being two and one-quarter inches, and the depth the same.

The appearance of Lark Buntings in great abundance about Great Falls in the spring of 1921 was heralded by people generally thereabouts as a harbinger of good crops, for the birds are stated to have been very infrequent in this section of the state for years during seasons of bad crops. They are locally called "Bobolinks".

**Vireosylva gilva swainsoni.** Western Warbling Vireo. First met with June 3 at Armington, along the foothills of the Little Belt Mountains, elevation 3500 feet.

**Vermivora celata celata.** Orange-crowned Warbler. This warbler does not appear to have received much attention at the hands of ornithologists, particularly in the matter of its song. It was my good fortune to find two of this race, both males, on their nesting grounds about the time of their arrival, namely, May 17. The region selected by them was a wooded, triangular ridge, lying between two mountain streams, sloping easterly (thus being early freed from snow), at an elevation of 5600 feet. Small willows and aspens, ten to twenty feet high, covered the ridge and grew for several hundred feet in every direction along the mountain slope, and about the blossoms of the former the warblers were searching for their insect food.

Each bird had apparently selected his "general nesting site", or nesting area, and these were about 500 feet apart. Both birds sang at short intervals for the five hours they were under observation; one confined its singing and



feeding to a small tract not over forty feet across, and appeared not to visit or be visited by a mate. An effort was made to learn if the birds were in fact mated or that nesting had already begun, but no evidence of either was found. I believe that they were fresh from their winter quarters, that they had selected the general site for their nests and were awaiting the arrival of the females, after the manner of Red-winged Blackbirds and other species. This race arrives on the average at Columbia Falls, Montana, May 5, and at Aweme, Manitoba, May 7.

The birds commonly procured their food from two to ten feet from the ground. They were not excessively active; in fact, for warblers, they were

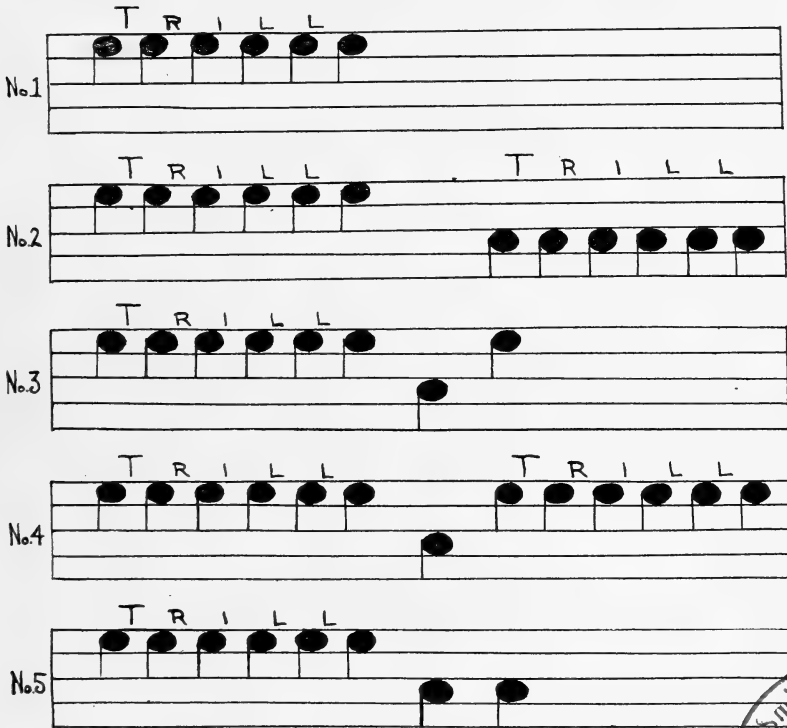


Fig. 29. SONG-FORMS OF THE ORANGE-CROWNED AND LUTESCENT WARBLERS. NUMBERS 1-4, ORANGE-CROWN; NUMBER 5, LUTESCENT WARBLER. THE LAST TWO NOTES OF NUMBER 5 ARE GIVEN WITH AN APPROXIMATE INTERVAL BETWEEN.

fairly moderate in their movements. The song of one Orange-crown was studied carefully at short range. This bird had a single song subject to four variations, each including at least one trill. Each trill was on a single note, but one variation had two trills about four tones apart, and another had two trills on the same note separated by a lower note. The pitch was near that of the Nashville's song, that is, at about the upper limit of the piano. For this type of song the trills were not given with excessive speed, but the number of notes in each could not be counted with certainty. All the notes appeared to have the same length, the whole having such an exceedingly simple arrangement that I am attempting to represent the four variations below, indicating,

however, only their *form* (fig. 29, nos. 1, 2, 3, and 4). The musical staff and notes are used as a matter of convenience and not with the intent of giving the songs in musical notation. If these song-forms prove to be the common ones of the Orange-crown, my hope is that they may assist in identifying the bird in the field, perhaps better, at least with average bird students, unacquainted with music, than by representations of the songs at the hands of a skilled musician.

**Vermivora celata lutescens.** Lutescent Warbler. On the same date that the Orange-crowns were found, and farther up the mountain, about a half a mile away, there was a single bird of this race singing from, and feeding in, thick chaparral near the ground. During the half hour he was under observation he sang but one song which closely resembled the Orange-crown's opening trill (see fig. 29, no. 5), but closing with two lower and slower notes suggesting *sweet-sweet*.

This race is not known to nest as far east as the Rockies and hence was probably migrating; but an isolated singing male at this season suggests that the bird was on its nesting grounds. Some nesting dates elsewhere are: Alameda County, California, April 5; and Tacoma, Washington, May 3-28.

The bird was strikingly colored, of very yellow plumage having an olive cast, and it appeared to be specifically distinct from *celata*. As I examined the bird at short range through a field glass it seemed to me that the two races were nesting here side by side without intergradation.

**Dendroica auduboni.** Audubon Warbler. First appeared at 5600 feet, May 19. Ranges to 7100 feet. Here a mountain species, confining its summer range to the medium-sized lodge-pole pines.

**Regulus calendula calendula.** Ruby-crowned Kinglet. Occasional at elevations of 6400-6600 feet in large conifers along mountain streams. They were heard singing every day, but the song of the eastern bird was in no instance given in full, only its opening notes. The terminal three to four times repeated closing notes, often anglicised as "Look-a-me, look-a-me" etc., in no case were sung. A. A. Saunders (Auk, vol. 36, 1919, pp. 525-528) has written at length on the geographical variation shown in this kinglet's common song, and I am glad to add my testimony to the same effect. Saunders says that the Ruby-crown sings this abbreviated song wherever heard throughout the western half of Montana, an area including the Little Belt Mountains. Bird students who are afield in the Cordilleras, particularly easterners, should mark the range of this most interesting and unusual kinglet, which appears to occupy many thousand square miles of territory, and, while not known to differ subspecifically from the eastern bird, yet possesses a less complex song. As the eastern Ruby-crown's song appears to be an elaboration of that sung by the Montana birds, it may be fairly argued on evolutionary grounds that they (and the Pacific Coast races too if their song is indistinguishable from that of the eastern birds) have descended from the Montana birds. Those taking the opposite view will see in the less complex song of the Montana birds evidence of devolution rather than evolution.

**Mvadestes townsendi.** Townsend Solitaire. On May 15 my attention was attracted to the Solitaires by hearing them sing as they were migrating northwardly over the mountains as single birds and in pairs. They commonly flew well above the mountains so that identification was made by their songs. A day

or two after this, at an elevation of 7000 feet, a single bird was seen at a little camp belonging to a prospector, consisting of a tent pitched amid scattered pines, with snow all about excepting where the sun had locally exposed the forest floor. A number of men with a pair of horses were working here, felling trees and dragging logs, when the Solitaire alighted close to us on the ground, flying from a perch on the top of a tall pine, where he had been singing. I was able to approach within fifteen feet of the bird when he flew, ascending above the pines in little curved flights first to the left and then to the right as if confused, or uncertain where he wished to go. Later, this peculiarity was found to be much elaborated as an accompaniment to the flight singing of the species, used both in ascending and descending. A number of times on this date a Solitaire could be heard singing high in the air and well above us up the mountain, and sometimes it could be seen coming down the steep slope just over the trees with great velocity, alighting suddenly on a tree top, when he would again burst into song. On May 24 I witnessed the beginning of a song-flight, no doubt a courtship performance, of which the precipi-

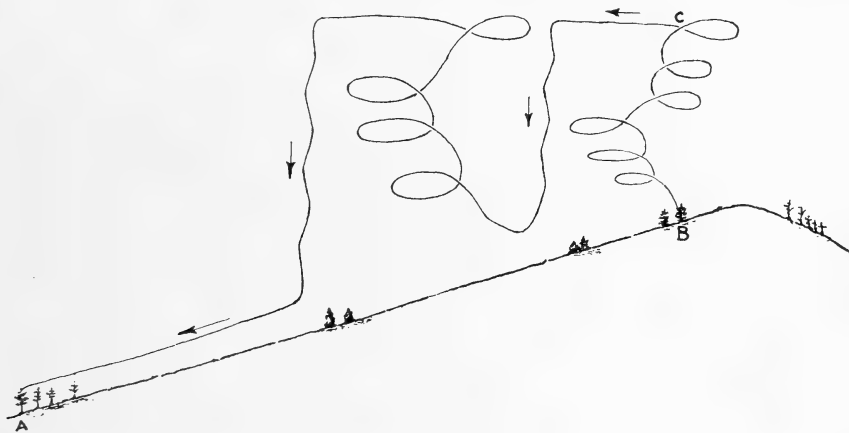


Fig. 30. DIAGRAM OF SONG-FLIGHT OF THE TOWNSEND SOLITAIRE. A-B, 1420 FEET; B-C, 500 FEET. ELEVATION OF RIDGE (B), 7300 FEET.

tate descent over the tree tops just described is the termination, although at that time the birds appeared to have mated.

I was standing on a nearly treeless ridge, at an elevation of 7300 feet, when a Solitaire which was singing close by on a stunted pine, flew upward in two series of irregular spirals. The first series was made by circling to the left, and the second series by circling to the right, as shown diagrammatically in figure 30. By this method the bird mounted to a height of perhaps 500 feet, singing at intervals. Then he started off as though to leave the vicinity, when, suddenly and with astonishing velocity, he plunged downward, apparently with set wings, in a succession of steeply-pitched zigzags, almost to the ground, and then turned abruptly upward again in a second series of spirals of the same character, which ended in another zigzag drop of at least 700 feet when he disappeared down the slope.

A little time afterwards the bird reappeared and joined a second one in a group of fire-killed pines standing in deep snow accumulated on the lee slope of the ridge. The pair sat on a dead tree and occasionally dropped to the snow to pick up insects which had become chilled by coming in contact with the cold

surface, acting like a pair of bluebirds. This same afternoon I witnessed again this extraordinary song-flight, which varied only a little from the previous performance. The spirals as before were very irregular in apparent diameter and the angle of the ascent was inconstant. A flight exhibition lasted about two minutes. In the diagram (fig. 30) the symmetry of the spirals is much exaggerated, the actual course of the bird being unknown in detail, but the zigzag lines are not far from accurate. The bird began its song-flight from near the crest of a ridge and ended it with a zigzag drop of 700 feet and a rush down the mountain to a point a quarter of a mile from its place of beginning, only to again burst into song as it alighted on the top of a pine.

On the 20th I ran across a pair of the birds in small, rather open timber, where it was warm and sunny and where the ground was free from snow. The birds did not sing, but were busy searching for food. As before, their bluebird-like method of finding insects was in evidence, and these were pounced upon, whether discerned on the ground or on the sides of tree trunks, or were secured by hovering over some promising spot where one had been discovered. Only one call was heard, a whistled *ick* similar to that made by the Rose-breasted Grosbeak.

Various observers who have written about this species have differed greatly, both as to the character of its song and its seasons of singing. Lack of agreement in describing bird songs is to be expected, as a rule, but the published accounts of the Solitaire's song periods seemingly stamp the species as very abnormal in this respect. The following references are believed to be representative of the many published descriptions:

F. S. Hanford (Condor, vol. 19, 1917, p. 14) has apparently been most fortunate in hearing the bird at its best and he thus describes its song: ". . . The feathers of his breast and throat rose with a song that softly echoed the beautiful voices of the brook, the gurgling eddies, the silver tinkle of tiny cascades, and the deep medley of miniature falls. Infinitely fine and sweet was this rendering of mountain music. At times the song of the bird rose above . . . the water in rippling cadences not shrill, but in an infinite number of runs and modulated trills, diving away again and again to low plaintive whispering notes suggestive of tender memories." This song was heard in early spring. Fuertes (Bird-Lore, vol. 16, 1914, p. 2) says their song is a "blithe, Grosbeak warble, frequently given in lark-like flight." W. L. Dawson (Condor, vol. 21, 1919, p. 14) describes it, as sung from a perch, as "broken and fragmentary, and is rendered in a matter-of-fact, passionless way." Williams (Auk, vol. 7, 1890, p. 98) records the song as "loud, varied, and Thrush-like, and is uttered as they mount rapidly upward in short zigzag flights to a height far above the pines." Knowlton and Ridgway (*Birds of the World*, p. 672) say its song is a blend of the songs of the Purple Finch, the Wood Thrush and the Winter Wren, this description, however, apparently being taken from Coues' *Birds of the Northwest*, and Coues in turn quotes it from a letter written to him by Trippe.

The writer heard these birds sing nearly every day for two weeks, but in the face of such varying descriptions as given above, he hesitates to add still another to the list. Recognizing, however, that a descriptive account of a complex song will convey little transferable knowledge, I will give my impressions for what they are worth. The perch and flight song of the Solitaire is

distinctly a warble which daily reminded me of the simple song of the Cassin Purple Finch (*Carpodacus cassinii*), a bird heard here at the same time. The flight song is uttered with great rapidity, with a musical range of less than an octave and, in common with many flight songs, the notes are more or less jumbled. Its duration, by repetition, is of unusual length. The perch song is similar, less ecstatic and slower. As the use of the word "warble" is likely to convey a different idea to different people, it may be well to state what I mean by its use, namely, a rapidly-uttered, often repeated succession of notes very slightly accented, and of narrow musical range. In the case of the Warbling Vireo (*Vireo gilvus gilvus*) the different notes and their range may easily be made out, but the Solitaire's flight warble does not permit of any such analysis.

It is perhaps in the matter of the bird's season of singing that writers are mostly at variance. Hanford (*loc. cit.*, p. 13) says: "So rare a singer is the Solitaire that during my mountain rambles, extending over a period of thirteen years, I have heard the song on only five occasions." Gertken (*Auk*, vol. 33, 1916, p. 327) found it singing in Minnesota in December. Trippe, quoted by Coues (*Birds of the Northwest*, pp. 95, 96), says: "In summer and fall its voice is rarely heard; but as winter comes on, and the woods are well-nigh deserted by all save a few Titmice and Nuthatches, it begins to utter occasionally a single bell-like note. . . . Toward the middle and latter part of winter, . . . the Fly-catching Thrush delights to sing;" and farther, "Toward spring, as soon as the other birds begin to sing, it becomes silent." Beckham (*Auk*, vol. 2, 1885, p. 140) also found them entirely silent in Colorado from April 22 to June 1, singing the latter week in September. Coues (*Birds of the Colorado Valley*, p. 47) writes that J. K. Lord heard some twenty Solitaires in song in November at a time when the cold was intense, and Drew (*Bull. Nuttall Orn. Club*, vol. 6, 1881, p. 86) found them singing in Colorado in October.

The Solitaire is thus reported, by the combined testimony of several observers, to be in song, at least at intervals, from September to February inclusive, and by two observers to be silent during the customary singing season. Others, however, including the writer, find the species quite normal in the matter of having the usual spring singing period. It is difficult to account for the reports that this species does not sing during the courting and nesting seasons.

***Hylocichla fuscescens salicicola*.** Willow Thrush. Two birds seen in Great Falls Park, June 1, no doubt recently arrived.

***Hylocichla guttata auduboni*.** Audubon Hermit Thrush. Earliest seen on May 22 in the pineries at 6500 feet elevation. Those familiar with the eastern race will not fail to note the less rufous tail of *auduboni*. They were first heard to sing on June 4 on a steep mountain side. Here their song is heard under the most favorable conditions. I have a feeling of pity for any one who has no ears to hear this master of song: for any one who does not stop and reverently lift his hat as he listens to this anthem singer of the mountains.

*Cambridge, Massachusetts, March 2, 1922.*

## WASTED ORNITHOLOGICAL MATERIAL

By W. H. BERGTOLD

WITH ONE PHOTO

IN THE HISTORY of all sciences it appears that the first and early stages of study in each one concern the larger, more striking and general aspects of the subject; then, successively, come periods wherein the smaller, and yet smaller, details are investigated, without finally reaching any limit to the minuteness of the parts or details examined. Ornithology presents no exception to this rule; its study is now in the stage of examining its smaller, but not thereby less important, details. Hence ornithologists of today and of the future who wish to make substantial contributions to their science will have to work with the more humdrum and less showy particulars.

These are days of efficiency along all lines, days when even the aid of a cinematograph is invoked to reveal useless or awkward ways in the manual application of labor; days when no single item of material is wasted if there be any possibility of its being utilized. There is a widespread belief that men of science work on a higher plane than does the mechanic or laborer; it therefore behooves men of science to justify such a reputation by the higher accuracy and exhaustiveness of their work. In the light of such a reputation, what would be said of the workers in, and the students of, a particular science, many of whom waste many of the opportunities and much of the material coming daily to their hands? Moreover, how much more would be said condemning such a practice, if it were known that many of these opportunities and much of this material might never again be duplicated?

It is the object of these few remarks to draw attention to the fact that large possibilities for the accumulation of a rich mass of invaluable data of various sorts are inherent in the birds annually collected for bona fide scientific purposes, and that a considerable part of such possibilities is habitually wasted by a goodly proportion of bird collectors and preparators.

There is, the writer is given to understand, in one large museum of this country, more than a quarter of a million bird skins; these skins, because of their very existence in this museum, have not been wasted, but on the contrary they have been of great use in the study and development of the science of ornithology. *But*, has each and every one of these skins been made to yield all the valuable data inherent in it when it came to hand as a fresh bird, and before it was "made up" into a skin? Very few would be willing to answer "yes" to this question.

Circumstances of equipment, climate, country, etc., often make it impossible for a collector to secure and record all the data pertaining to a fresh bird; no criticism can lie justly against such a worker. However, a large number of bird collectors and preparators are not handicapped by such conditions or circumstances, and yet they fail utterly to make record of many scientific facts related to each fresh bird. Each bird skin in any collection obviously means the possession of a freshly killed bird, at some time by some one, usually a trained preparator or a scientific collector. It is true that many careful and enthusiastic collectors make every effort to utilize in every way fresh speci-

mens coming to their hands; yet one is safe in saying that a much larger proportion of workers do not do so. The freshly collected bird is skinned and properly labeled, and the matter ends there. Surely every newly collected bird has in it more of importance than that—has valuable aspects and possibilities which can be studied and recorded without in the least depreciating its final value as a collection specimen.

Let us enumerate, in part only, what ways a freshly killed bird can be studied before it is finally "made up" into a "skin".

Of these a few are: 1. Its external parts: A. Its measurements. B. The color of the soft parts and the irides. 2. Collecting its dermal parasites. 3. The weight of the specimen. 4. Preserving its "stomach" and contents. 5. Collecting its intestinal parasites. 6. Taking the bird's body temperature if it be secured before or just at death.

It is quite unnecessary now to discuss some of the items mentioned above, for collectors have long since learned that without data relative to them a bird skin is scientifically almost worthless. It is, however, proper now to touch upon some of the others.

Probably all birds have dermal parasites. It is an extremely simple matter to have on one's work table, or desk, or in one's field kit, a few empty phials (one dram), and a stock bottle of a 40 percent solution of formaldehyde or denatured alcohol; then, before skinning a specimen, one can, with a pair of forceps and a little care and patience, and at the expense of very little time, pick off the parasites from the bird's feathers, and save them in a phial of preservative. The addition of a label, on which should be written the date, locality, and host, makes complete a collected side-issue which will be welcomed by an entomologist, and which may develop large value both in entomology and ornithology. If any one ask of what value are such parasites an answer can be found in articles by Kellogg (*Auk*, vol. 16, 1899, p. 232) and by Ferris (*Journ. Mammalogy*, vol. 3, 1922, p. 16).

The writer makes the collection of parasites his duty when handling a "flesh" specimen. As an example of the value of any one's efforts along such lines, he may be permitted to say that one species of avian dermal parasite collected by him had never been collected before in the western hemisphere, and also that he was able to help establish the fact that dermal parasites from Bohemian Waxwings taken in Colorado are similar to those taken from Old World Bohemian Waxwings. All dermal parasites coming from a single specimen should be kept together in one container, and due care should be taken to prevent transference of parasites from one specimen to another by avoiding promiscuous packing together of freshly collected different species. Other parasites frequently are found in a bird's digestive tract. These, too, should be collected, properly preserved and labeled, and sent to a helminthologist. Such specimens are always welcome. There is much room for research along these lines. An investigation of such parasites may disclose interesting and even important relations between birds and associated forms of life; for example, as between the intestinal parasites of fish-eating birds, and those of the fish of their habitat waters (Butler, E. P., *Studies in the Enteroparasites of Birds and Fishes of Douglas Lake, Cheboygan County, Mich., 1921* [Thesis, Smith College]; Chandler, *Journ. Amer. Med. Ass.*, March 4, 1922, p. 636). The study of the intestinal parasites of man is by no means complete; it possibly might



be made much more so by a systematic and painstaking collection and study of bird enteroparasites.

One explanation of the differing lengths of incubation among birds is that the incubation length is correlated with the bird's size, which means in the last analysis, its weight. One writer (Bergtold, *Incubation Periods of Birds*, 1917) who studied this question was able to find recorded in the ornithological literature at his command, the weights of only (approximately) ninety-three species, which, together with sixty-seven others secured by his own personal efforts, made a total which is less than one and one-half percent of all the known avian species. Is it not ridiculous, not to say inexcusably wasteful, in the face of this dearth of data, that any one should neglect to weigh a bird

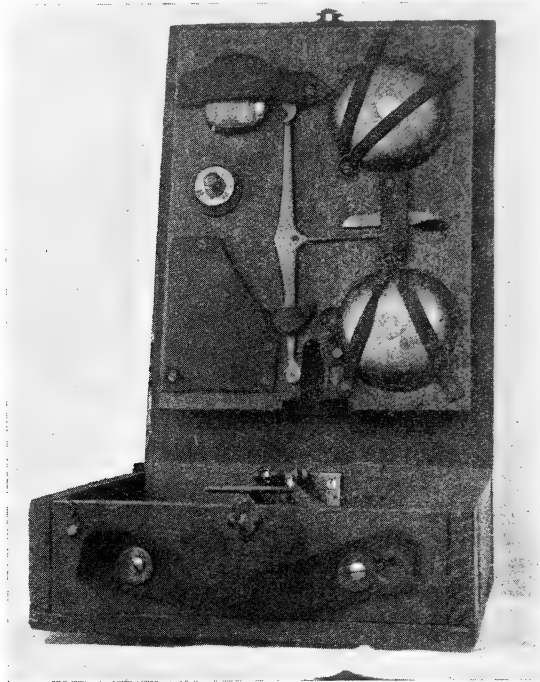


Fig. 31. FIELD SCALES, FOR WEIGHING BIRDS,  
HERE SHOWN PACKED IN SPECIAL BOX FOR  
CARRYING.

when it comes to the skinning table? It takes but a little time to weigh an ordinary bird; a well equipped collector or preparator should have at his command a set of small scales, both in his work shop and in his field kit. A compact and light set of scales for the field can be made very easily out of a set of moderate sized druggist's beam balances; the writer has made such a set and carries it with him on all of his collecting trips, and on excursions when no birds are to be collected, but when eggs may be found, and weighed.

This set of scales was made by the writer, and designed to combine minimum weight and size, and maximum efficiency. With it the writer has weighed birds as large as a crow. When closed it is a compact box, ten inches high, seven inches broad, and two and one-half inches thick, its total weight is two

and one-quarter pounds. A druggist's beam balance was used in this portable combination; it will be seen from the accompanying illustration (fig. 31) that the pans, beam, weights and other parts are attached to the inner surface of one side of the box in such a manner as to be easily taken off. The assembled scales are set up on the beam post which is fastened to the center block, to which are also hinged each side of the box. The two box sides fall down onto the supporting surface (table, for instance), leaving the center block and beam post in place.

Such a combination can be used in the workshop as well as in the field, and with it much valuable information can be accumulated which probably is usually wasted. The age, sex, seasonal, and geographic variations in avian weights form a subject as yet almost untouched by the ornithologist; at least it so seems to the writer, who believes that it is not a routine act with most collectors and preparators to determine and record the weight of a freshly killed bird. The paucity of records of bird weights in literature seems to justify this belief.

There is relatively little known concerning the body temperature of birds. That there is a more or less close relation between the temperature of a bird and the length of its incubation period seems indisputable to the writer. The exact delimitation of the relations between these two phenomena awaits solution, at least until a large amount of data concerning avian body temperatures shall have been gathered under known, approved, and carefully recorded conditions, and then studied and analysed hand in hand with the equally carefully determined incubation period length of the corresponding bird.

There are thousands and thousands of birds' eggs preserved in our museums and elsewhere, and, along a few restricted lines, a study of them has been distinctly productive of advances in ornithology. It is highly probable that the known weights of the eggs of different avian species does not include more than one percent of the world's birds. For years ornithologists have said that the differing lengths of incubation among birds is dependent on the differing sizes of their eggs. In the last analysis, size of eggs, in this instance, means weight of eggs. How valuable can an explanation be which is based on less than one percent of the possible data?

From the viewpoint outlined by these remarks, it would probably be exceedingly discouraging if one were to know what the percentage of collected and preserved bird "stomachs" is to the total number of birds annually collected for other purposes. It seems quite unnecessary to call attention anew to the vast economic possibilities opened up by a scientific study of the food of birds, a study which is best promoted by investigating the "stomach" contents of birds. The Biological Survey at Washington welcomes all such material and disseminates for the benefit of all concerned the knowledge gained from it.

The list of different possibilities for study in a freshly killed bird has only been touched upon in the above remarks; many more could be enumerated, all of surpassing interest, and many with a chance of opening up large fields of important discovery, and original worth. The writer has felt for years that such a waste of opportunity and material should not continue; not only because it is utterly unscientific, unproductive, and inefficient, but also because many such opportunities, and much of such material may, in the fu-

ture, never again be at hand. The material is as much lost as is the dodo. Is it not time for many of us collectors and preparators to about face, and be scientific and efficient in action as well as in aspiration and reputation?

*Denver, Colorado, March 4, 1922.*

## NOTES ON THE AMERICAN PINE GROSBEAKS

### WITH THE DESCRIPTION OF A NEW SUBSPECIES

By ALLAN BROOKS

SOME ten years ago I received from Mr. C. deB. Green several pine grosbeaks that he had taken near Masset, Queen Charlotte Islands. These were quite unlike any of the North American pine grosbeaks I had seen and I identified them as *Pinicola enucleator flammula* Homeyer. When in Washington in November, 1920, I had the opportunity of examining the series of that subspecies from the type locality in the national collection, and it was obvious that the Queen Charlotte bird was a distinct subspecies, quite the best differentiated of all the American forms.

I have refrained from describing it for a number of reasons, chiefly in the hopes of increasing my series, which had been reduced to three skins. Over a dozen have passed through my hands, however, besides a number of others seen in life which I did not shoot, as Mr. Green wished to take their eggs. As there does not seem any immediate probability of acquiring further material I shall describe the subspecies herewith.

#### *Pinicola enucleator carlottae*, new subspecies Queen Charlotte Pine Grosbeak

*Type*.—Male, red adult, no number, collection of Allan Brooks; Masset, Graham Island, Queen Charlotte Islands, British Columbia; June 2, 1920; Allan Brooks, collector.

*Subspecific characters*.—Smallest and darkest of all the American subspecies; tail much shorter than in the other American races. Red of male deeper and more scarlet (less of a carmine); yellow of females and old males darker and suffusing the entire plumage more or less, except the center of belly, lower tail coverts, and under wings and tail.

*Description*.—Red male (type): Distribution of colors as in red males of this genus, the red nearest the "nopal red"; the interscapular feathers with dark brown centers; scapulars "dark mouse gray"; belly and flanks "mouse gray"; wings and tail "fuscous black", outer edges of all the feathers, except tertials, "mars orange"; white markings of wings much restricted, the two bars on coverts tinged with rose, the edgings to tertials very narrow and grayish; lower tail coverts edged with whitish, their centers "deep mouse gray".

Iris brown, upper mandible black, lower dark brownish gray; feet brownish black. Measurements (average of two males): Length (skins) 193 millimeters, wing 109, tail 79.5, culmen 14.5, depth of bill at base 10.5, width of mandible at base 9.3, tarsus 20.5.

Female: Coloration as in females of the genus, but the yellow areas more extensive and the color much darker. Yellow of head nearest to "orange-citrine" but more red, of rump and upper tail coverts, brighter and more yellow; the breast, flanks, and interscapulars overlaid with a strong wash of "orange-citrine", and the feathers of wings and tail, except tertials, edged with same; tertials edged with ash gray; chin buffy;

ventral region "mouse gray", lower tail coverts the same edged with paler. White bars on wings very restricted, the centers of all the wing and tail feathers "fuscous black". Wing 108, tail 82, culmen 13.5, depth of bill at base 10.5, width of mandible 9, tarsus 20.5. [Colors in quotation marks from Ridgway's *Color Standards and Color Nomenclature*, 1912.]

It will be seen that while the bill in *carlottae* is proportionately large and strongly hooked, it is not nearly up to the dimensions of that of *flammula* as given by Ridgway. Probably the Queen Charlotte bird more closely approaches true *enucleator* from western Europe than any of the American subspecies.

In conjunction with the foregoing descriptions I have carefully gone over my entire series of pine grosbeaks, some thirty in all not counting these very distinct Queen Charlotte birds. The result makes me hope that someone with plenty of material at his disposal will review the group.

All the specimens that I have sent back to Washington have been identified by Dr. Oberholser as *montana*. These include winter specimens from the interior of British Columbia and one breeding bird from the coastal slope of the Cascades (international boundary). The former I took for *alascensis*; they seemed to agree with specimens from the Cariboo district (central British Columbia), identified by the late William Brewster as such.

This winter (1921-'22) we have had in the southern interior of British Columbia an invasion of very large, purely colored birds, the grays as pale as, or paler than, in eastern Canadian *leucura*, the rose-pink of the males sometimes covering the greater portion of the lower surface. These must be *alascensis*, as the bill proportions agree with Ridgway's description. But Ridgway, the describer of both *alascensis* and *montana*, indicates by the measurements he gives that the latter is the larger of the two, not only in the bill but in average dimensions. The breeding birds that we get in southern British Columbia are very much smaller than these winter birds, nor is the bill longer or larger in any way.

A small series of winter taken birds from Edmonton, Alberta, agree exactly with these large winter birds from British Columbia. Neither series is very different from eastern (Ontario) birds. The westerners are a little larger, perhaps, but the Ontario birds seem to suggest the inclusion of two different types. One lot is larger with heavier and more strongly hooked bill, and the red males are more purplish and with dark centers to the feathers of breast. The other eastern form, the commoner, is smaller, more pink, the colors more uniform, and the bill smaller and less hooked.

The red males of *Pinicola* I regard as birds of the year, and I doubt if the red plumage is held for more than one year. The succeeding plumage may be the reddish one figured as the immature male in Bird-Lore (vol. 14, 1912, no. 6). This plumage, where the yellows on head and rump are replaced by dull red, is common to both sexes and is only occasionally seen. A still rarer type of plumage in the male is where the rose-red is replaced by salmon-pink, probably a freak like the yellow types of *Carpodacus*.

The proportion of red males in *Pinicola* is much smaller than in *Loxia* or *Carpodacus* and is probably not more than one in three of breeding birds. The proportion of red males in collections may be higher, but this is obviously due to the fact that collectors will take a red male in preference to a gray bird in nearly all cases. One will often see a flock of a dozen or more birds without

a single red male among them; this rarely, if ever, occurs with *Loxia*, or *Carduelis*. Of five breeding pairs seen in the season of 1920, only one was a red male. In the others the sexes were indistinguishable.

*Okanagan Landing, British Columbia, March 3, 1922.*

## THE ALEUTIAN ROSY FINCH

By G. DALLAS HANNA\*

WITH ONE PHOTO

THE RANGE of the Aleutian Rosy Finch (*Leucosticte grisconucha*) is rather extensive, since it has been found from Kodiak Island west through the Aleutian Islands as far as the Commander group, 1000 miles away. It is also found on the Pribilof and the Mathew groups, 200 and 400 miles, respectively, farther north. The species has always been extremely rare wherever I have met with it, except on the Pribilof, or Fur Seal, Islands. When I landed there in 1913 it was nesting in the village and on the cliffs in considerable numbers.

The beautiful song of the male was new to me then, and it seemed the most attractive feature of the desolate place. It is excelled by the song of no other species on these islands, and is rivalled there only by that of the Alaska Longspur and of the Pribilof Snow Bunting.

The annual cycle of the Aleutian Rosy Finch possesses considerable interest because of several unique features. A convenient starting point in an account of it would be August 31, when the last birds have hatched out and practically all have flown. The autumnal molt then begins, and with this the beautiful song is replaced by a rather commonplace chirp of ordinary finch character.

These birds gather in loose flocks, even in the height of the breeding season; in the fall the flocks become larger and more compact. It is no uncommon sight in fall or winter to find fifty birds feeding on a single patch of "poochkie" (*Heraculum*) heads, and during periods of especial abundance I have seen as many as a hundred at a time. Although the seeds of many plants are eaten, those of the "wild parsnip" compose by far the greater part their diet. These seeds are well filled with oil, being similar in that respect to sunflower seeds, and must provide much fuel, to enable the birds to withstand the vigorous Arctic gales so common in that latitude.

There is very little change in the coloration of the adults with the assumption of the winter plumage, and the young of the year are indistinguishable from the older birds by late fall. One of the most striking results of the change of season from summer to winter is in the color of the mandibles. In summer these are dead black, but winter turns them to a brilliant lemon yellow.

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\*Contribution from the California Academy of Sciences.

low, the tips only retaining the dark color. No shedding of the horny substance of the mandible takes place; it is merely a matter of coloration; and for what reason?

I have been led to believe that there is an irregular migration—or perhaps it might properly be called a flight—of Pribilof Rosy Finches to the Aleutian Islands in winter. There appeared to be a fluctuation in the numbers of the birds which could be explained in no other manner. They do not all leave the Pribilofs at any season, regardless of severity of the weather, and weather conditions could not be correlated in any way with the variation in their abundance. While it is possible that these variations might be such in appearance only, due to flight to portions of the resident island rarely visited by man, careful study of the subject through several winters did not satisfy me that this was the case.

These birds continued to be abundant from 1913 up to the winter of 1916-17, when a terrible catastrophe befell them. The Pribilofs that winter were visited by a number of gyrfalcons, and these wreaked havoc among the resident land birds. Dr. Harold Heath has outlined the case of the Alaska Wren, as regards fluctuations in numbers (*Condor*, vol. 22, 1920, p. 49). The Rosy Finches, as these leucostictes are locally known, fared little better. The first gyrfalcons killed were examined, and in their stomachs was found unmistakable evidence of slaughter—the rosy feathers of their victims. Their prey was so easily captured on the barren Pribilofs that the falcons became extraordinarily fat. So oily were they that the preparation of specimens was exceedingly difficult. The offering to the natives of a bounty of one dollar for each capture was instrumental in securing thirteen of them, a greater number than the total which had been seen on the Pribilofs since observations commenced.

During the winter season the rosy finches remain in the immediate vicinity of the cliffs. This made them easy of capture by the gyrfalcons, which seemed to be especially at home in such surroundings. When the summer of 1917 came, scarcely a finch could be found. Only one pair nested on St. Paul, and one pair on Otter Island. A few more were left on St. George, but the species would have been classed as exceedingly rare even there. The total number was not over twenty-five, which is an optimistic estimate. How fortunate it is that the seal islands are normally free from such a scourge as these falcons proved to be!

Through succeeding years the rosy finches were watched with great anxiety, and it was gratifying to see their numbers gradually increasing. By 1920 there were, perhaps, a dozen pairs on St. Paul Island and a hundred on St. George, but even the latter was still underpopulated.

This circumstance serves as a fair illustration of the precarious existence led by island birds in general. In the short space of two or three months a species may be almost entirely annihilated by the sudden appearance of an enemy that is normally absent. The rarity of the Aleutian Rosy Finch elsewhere in its range is commonly believed to be due to the work of birds of prey there found. Singular to relate no hawk, eagle, or owl lives on the Pribilofs except as a straggler.

Two indicators of spring mark a point in the Aleut's calendar. One of these is the coming of the Least Auklets (Choochkies) with clock-like regular-

ity on April 15 of each year. The other is the first song of the Aleutian Rosy Finch, at about the same time. Catching the spirit of the birds the lethargic shackles of winter are shaken off by the human inhabitants of these islands, and the wheels of industry start. The awakening of spring brings much activity with it.

At this time the birds soon seek out nesting sites, and building begins in May. The earliest full set of eggs of the Rosy Finch that is recorded was taken in May. I have never been able to convince myself that the male bird rendered any assistance at all in building the nest, incubating the eggs, or rearing the young. However, the sexes are so nearly alike that a mistake as to their identity could easily be made by an observer of their actions around the nest, and the subject needs further study.



Fig. 32. TYPICAL NEST AND NESTING SITE OF ALEUTIAN ROSY FINCH  
ON ST. GEORGE ISLAND, ALASKA.

The males spend the greater part of the summer in fighting each other. In fact the moral code of this species seems to be drawn up somewhat upon Turkish lines, only reversed. Often a female may be seen pursued by half a dozen suitors. When the female is off her nest, her mate (or, at least, some mate) is constantly close beside her, and, if rosy finches are abundant, many is the battle he has to fight. Or, as she feeds along some narrow ledge, two contestants for her favors may now and then come tumbling down to the beach line, flapping and pecking at each other, their places as attendants being soon taken by a third party.

While nests have been found in old buildings, the favorite site for nest building is in some crack or crevice of the precipitous cliffs on the shores of



the Pribilofs. Some of these rise to a height of a thousand feet and form incomparable bird rookeries. Although there is almost no zoning of the eleven species of sea birds nesting there, the lowermost nests are, in almost every case, those of the kittiwakes. In some instances the fulmars, murre and cormorants are equally low, but not often. The lowermost of these do not usually approach the beach line closer than twenty-five feet, and it is in the space from there down that the Rosy Finches most often build. On rare occasions the nests of the latter may be reached by hand, but the birds are seldom so injudicious as to run such risks. The nest is neatly constructed of the dry grasses most accessible, and the lining is of similar material, but softer and finer than that used for the body of the nest. Seldom are roots or feathers used in nest construction.

The length of time a female remains off her nest depends, of course, upon the state of incubation of the eggs; when she returns to it, the male settles on some favorite nearby rock and pours forth his beautiful song, repeating it time and time again. The serenity of the scene is interrupted only by some wandering finch which must be chased away most vigorously.

The normal set consists of five eggs, but four and six are not infrequent. While the color is usually pure, immaculate white, in some cases there are faint reddish or yellowish brown spots or, more often, specks, many of which are almost microscopic in size.

Two broods of young are raised each year under normal conditions, and hence this species increases rapidly in numbers if free from enemies. The period of incubation is not definitely known, but the second sets are laid by August 1 in the majority of cases. It is believed that the same nest is used for both sets, or at least the same location. Sometimes it appears that a portion of the old nest is torn out and then reconstructed. The young of summer plumage are uniform grayish brown, and show no trace of the brilliant rose and pink colors of adults in breeding plumage.

The Aleutian Rosy Finch has endeared itself to all those who have come to know it, and being one of the most beautiful of the sparrows it is a misfortune that it is so isolated in habitat.

*San Francisco, March 23, 1922.*

## EGGS OF THE ALEUTIAN ROSY FINCH

By JOSEPH MAILLIARD\*

WITH ONE PHOTO

IN CONNECTION with the interesting article upon the Aleutian Rosy Finch (*Leucosticte griseonucha*) by Dr. G. Dallas Hanna, just preceding, I submit the following notes upon a series of the eggs of this species.

The size, shape, and the tint of the white of these eggs vary considerably, while, on careful examination, a good many more of them are marked by spots

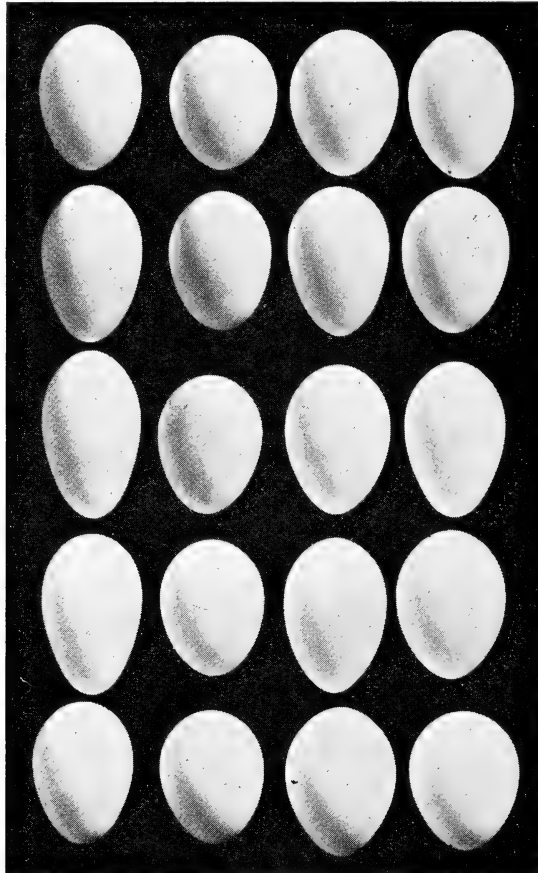


Fig. 33. FOUR SETS, FIVE EGGS EACH, ARRANGED VERTICALLY, OF ALEUTIAN ROSY FINCH, SHOWING VARIATION IN SIZE AND SHAPE.

or specks than is ordinarily supposed. For the most part these spots are of a yellowish or slightly reddish brown. Many are mere specks, some of which are so slight and faintly colored as to be barely perceptible without the aid of a magnifying glass, while other eggs show spots that are minute but strongly

\*Contribution No. 137 from the California Academy of Sciences.

colored. Some of the sets have one or two eggs with these small specks, and yet have one or two others that are very distinctly marked, for this species. One set has distinct spots of a delicate rosy pink tinge, another set has some of the eggs splotched rather than finely spotted or speckled, and these splotches are reddish in color.

Of forty-four sets of five eggs each, together with one of six eggs, fifteen of the sets were unmarked, nine contained one spotted egg, none had two eggs spotted, eight had three eggs, seven had four eggs, eight all five, while the six-egg set had all but one spotted. Some of these markings look like an incidental stain, as from wet grass or a fly speck, but the magnifying glass shows them to be natural coloration. The greatest number of spots or specks is usually at the larger end of the egg, and in some cases these are arranged somewhat as a ring. In other cases a spot or two on any part of an egg may be the only marking.

Both size and shape of the eggs of this species are very variable. The longest egg measured, in millimeters, 28.3 and the shortest 22.3, with an average of 24.6 for 115 eggs measured; while the width showed extremes of 18.8 and 15.9, with an average of 17.5. There is no particular correlation between the two diameters, however. For example, the longest egg measures  $28.3 \times 17.0$ , while the third shortest in the lot is  $22.8 \times 18.2$ , the one long and slim and the other short and fat.

The measurements of the sets used in figure 33, from left to right are as follows:

(C. A. S. No. 1743)  $28.3 \times 17.0$ ,  $27.2 \times 17.2$ ,  $26.4 \times 17.3$ ,  $24.8 \times 17.6$ ,  $24.1 \times 17.2$ .

(C. A. S. No. 1677)  $23.5 \times 17.5$ ,  $23.0 \times 18.4$ ,  $22.8 \times 17.7$ ,  $22.9 \times 17.7$ ,  $23.4 \times 17.8$ .

(C. A. S. No. 3660)  $26.1 \times 17.4$ ,  $25.4 \times 18.8$ ,  $25.0 \times 17.9$ ,  $24.6 \times 18.3$ ,  $25.1 \times 17.3$ .

(C. A. S. No. 3539)  $26.3 \times 17.0$ ,  $24.9 \times 18.5$ ,  $24.5 \times 18.2$ ,  $23.2 \times 18.5$ ,  $25.4 \times 18.0$ .

Average length of the 115 eggs measured is 24.6, and average width is 17.7.

Set nearest to average of the 23 that were measured:

(C. A. S. No. 3543)  $24.8 \times 18.2$ ,  $24.3 \times 17.7$ ,  $24.5 \times 17.9$ ,  $24.8 \times 17.7$ ,  $23.8 \times 17.5$ .

The tint of the white of these blown eggs varies somewhat, as before remarked, but not through any great range. Newly laid eggs seem to vary from bluish white, through pure white to slight cream color, while those that have been more or less incubated are apt to become yet a little darker cream color. Possibly some sets have been exposed to an occasional wetting, when not well protected, or the parent may have come on the nest with some of its feathers dampened by rain, but on the whole there is great freedom from stain.

*San Francisco, March 23, 1922.*

## FROM FIELD AND STUDY

**Yellow-headed Blackbird in Company with Brewer Blackbirds.**—In volume XXII of THE CONDOR, page 205, Mr. Frank N. Bassett records the unusual occurrence of a Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) flocking with Brewer Blackbirds. Another instance of this was noted at Penticton, British Columbia, on October 19, 1921, when a single male was seen in the midst of a flock of about fifty Brewer Blackbirds. This was of interest to me not only for the unusual association of the two species, but on account of the scarcity of the Yellow-headed Blackbird in that locality and the late date on which it was seen. Another point of interest lay in the uncon-

ventional surroundings. One associates this species with tule marshes, or grain fields, and this bird seemed oddly out of place picking up refuse grain on a suburban street.—J. A. MUNRO, *Okanagan Landing, British Columbia, November 26, 1921.*

**The Occurrence of the Desert Horned Lark in Southern California.**—A careful analysis of the mixed flocks of horned larks that range the deserts and lowlands of California in such abundance during the winter has brought to light certain interesting facts and record stations for *Otocoris alpestris leucolaema*. The winter range of this form is given in both the third edition of the A. O. U. *Check-list*, and also by Oberholser in his review of the genus (Proc. U. S. Nat. Mus., vol. 24, 1902, p. 821) as "south to . . . southeastern California". But the most southern record station actually given by the latter authority is Keeler, Inyo County, California, in a section perhaps better referred to as east-central California, because of the transverse ranges that divide the state south of that point.

The specimens listed below from the A. B. Howell and D. R. Dickey collections indicate a far more general distribution of the species throughout the southern portion of the state, in fall, winter, and spring, than had heretofore been suspected. Only the sea-coast proper seems to escape their invasion. The Fort Yuma birds have been previously referred to (Condor, xvii, 1915, p. 233), but we trust we may be pardoned for repeating the record here with a view to incorporating all available pertinent data. A list of record stations follows.

Inyo County: Deep Spring Valley, 2 specimens, Sept. 20, and Sept. 26, 1921; Keeler, 1 specimen, Oct. 21, 1921.

Kern County: Buena Vista Lake, 1 specimen, Sept. 16, 1921.

San Bernardino County: Victorville, 4 specimens, Sept. 25, 1921; Newberry Spring, 1 specimen\*, Dec. 8, 1917.

Los Angeles County: Palmdale, several specimens, Jan. 5, 1921.

Riverside County: 10 miles south of Ontario, several specimens, Dec. 3, 1919, and Dec. 11, 1920; Thermal, 1 specimen\*, Jan. 27, 1918.

Imperial County: 10 miles west of Kane Spring, 1 specimen, Oct. 15, 1921; vicinity of Fort Yuma, 3 specimens\*, Jan. 28, 1913, and Jan. 29, 1921; sand dunes east of Holtville, 1 specimen, March 21, 1916.

We are indebted to Mr. A. B. Howell for kindly allowing us to put on record the birds in his collection, which are starred in the above list, and to Dr. H. C. Oberholser for verifying the determinations of several of the more doubtful birds.—D. R. DICKEY AND A. J. VAN ROSSEM, *Pasadena, California, January 13, 1922.*

**What Color are the Feet of the Western Gull?**—In the last volume (part 8) of Ridgway's *Birds of North and Middle America*, the color of the feet of the Western Gull is given as yellow in life. In Dr. Dwight's recent description (Proc. Biol. Soc. Wash., vol. 32, 1919, pp. 11-13) of the southern form of the Western Gull (*Larus occidentalis livens*) the color of the feet is given as "lemon yellow". This Dr. Dwight now regards as an error on the part of the collector of the type specimen. In the fourth edition of Ridgway's *Manual of North American Birds* the color of the feet is given as "flesh colored" (under description of *Larus fuscus*). This, I believe, is the invariable color in the adult.

What I want to know is: 1. Has any one seen a Western Gull with yellow feet? 2. If not, where did the mistake (if it is a mistake) originate? When I first travelled south along the Pacific Coast in 1911 I was under the impression that this gull had yellow feet, and was considerably surprised to find that among the hundreds of adults that I examined at close quarters in life nothing but flesh colored feet were in evidence. The full description of the soft parts as given by Ridgway in the *Birds of North and Middle America* (part 8, p. 610) is as follows: "Bill deep yellow, the mandible with a subterminal lateral spot of red; iris brown; bare orbital ring vermilion red; legs and feet yellow (in life)." Three spring adults collected by myself vary from this in every item except the color of the bill. They all agree in having the iris pale yellow or straw color, freckled with grayish; eyelid deep yellow, no trace of red; feet flesh colored; and claws dark brown. Can California observers supply data to settle this question?

This gull also seems to be unfortunate in the records of its occurrence, distribution, and nesting. The latest A. O. U. *Check-list* gives the correct distribution with the exception of the Colorado record, now known to be an error; but Ridgway has since then perpetuated the impossible record, first made by Fannin (*Check List of British Columbia Birds*, 1891, p. 4) of the breeding of *Larus occidentalis* in the Similkameen Valley, British Columbia—a locality which no gull would nest in, a narrow rocky gash in the mountains.

All Fannin's "*occidentalis*", so labeled by him on the bases of the stands of his mounted birds, were simply *Larus argentatus*. This, in all the harbors of British Columbia, being the next commonest gull to *Larus glaucescens*, he assumed it was the Western Gull—the common gull of the west. Many other observers seem to have made a similar mistake. They took the presence of the Western Gull for granted, a sort of ground pattern on which to work in the records of the other species. These last they identified; the "Western Gull" was assumed. In all my coastal voyages on various craft extending back for about thirty-five years I have never seen the Western Gull north of Cape Flattery, not even among the flocks following the steamers on Puget Sound—and I have always been keenly on the lookout for it. Once you round Cape Flattery, it at once becomes the most conspicuous gull.

There are only three records for British Columbia, a molting adult taken by Spreadborough on the south end of Vancouver Island, and two taken at Comox on the eastern shore of that island. The latter are both adults, one being of the light mantled type and the other the dark type so common in California, "*Larus occidentalis livens*" of Dwight. The first of these gave me an idea as to how the "yellow" feet of the Western Gull may have originated. When I shot it I noted that the feet were rosy flesh color. As it lay on the thwart of the boat in front of me, one foot was elevated, the other hung down. As the blood drained from the tissues the color of the elevated foot turned from rosy flesh to yellowish white, not "yellow" by any means, but what might possibly have passed for cream color of a very pale shade, the other foot remaining as in life.

The correct record of the colors of all soft parts is of the prime importance in the Laridae, where so many closely allied species have feet of very different colors. The two black-backed gulls of western Europe, *Larus marinus* and *L. fuscus*, can readily be told apart in life by the feet alone, the former having them flesh colored and the latter yellow. The many false records for the Kittiwake on the Pacific Coast would never have been made if the color of the feet had been looked up.—ALLAN BROOKS, *Okanagan Landing, B. C., March 3, 1922.*

**Waterfowl Caught in Fish Nets.**—On February 28, 1922, while driving along the shores of Tillamook Bay, Oregon, with Deputy Game Warden Geo. Russell, an adult male White-winged Scoter (*Oidemia deglandi*) was seen struggling in a salmon net in which it had become entangled. The net was set in about five feet of water. On being questioned the fisherman told me that during the past fall he had caught several each of loons, scoters and wild ducks in his salmon nets.—STANLEY G. JEWETT, *Portland, Oregon, March 10, 1922.*

**Further Record of Savannah Sparrow in California\*.**—Mr. C. I. Clay, in THE CONDOR, vol. 19, 1917, p. 68, published a record of the occurrence in Humboldt County, of the Savannah Sparrow (*Passerculus sandwichensis savanna*). This bird was identified by Dr. Joseph Grinnell of the Museum of Vertebrate Zoology, Berkeley, California, and constituted the first published record for the state.

During the field work of 1921 two sparrows were taken at Kneeland Prairie, Humboldt County, California, by Mr. Chester C. Lamb and myself, the identity of which I did not like to be too positive about without further professional opinion. These were submitted to the Museum of Vertebrate Zoology, and pronounced by Mr. H. S. Swarth as being typical *Passerculus sandwichensis savanna* of southeastern Alaska. These two specimens were taken on September 29, 1921, in company with some of the Dwarf Marsh Sparrow (*Passerculus sandwichensis brooksi* Bishop).

Two specimens of this genus were taken by Mr. C. Littlejohn and myself at Re-

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\*Contribution No. 135 from the California Academy of Sciences.

qua, May 4 and 5, 1921, which I have also placed with *savanna*. These two birds conform to this race in measurements, and in practically every way, except that the dark markings on the throat and breast are rather lighter than in the specimens I have had for comparison. These Requa birds were taken on the open hillside back of the town and were the only individuals of this genus we noted in that particular spot. The finding of these four examples of the race seems to indicate that the Savannah Sparrow is a more common winter migrant to the northwest coast of California than was heretofore supposed.—JOSEPH MAILLIARD, *San Francisco, California, February 8, 1922.*

**Crossbills Eating Aphis.**—Mr. Storer's note in the last May CONDOR (vol. 23, 1921, p. 98) regarding Crossbills eating aphis, recalls the fact that American Crossbills taken in Jasper Park, Alberta, the summer of 1917, had their faces and throats covered with bluish white bloom from woolly aphis apparently gleaned in the spruces. Last summer I had opportunity to watch a captive Crossbill in Manitoba. It was fed largely at the time on leaf galls from the poplars surrounding the house. The bird would open its bill and drive both points deeply into the soft mass of the gall until the mandibles were practically closed and crossed. Then, with a slight twist of the head, the gall would be split wide open. The hollow interior was seen to be filled with what appeared to be a sort of woolly aphis, which was rapidly cleaned out with the bird's tongue. The certainty, ease and rapidity with which the operation was performed indicated that the apparently awkwardly crossed bill was a most efficient implement for the work.—P. A. TAVERNER, *Victoria Memorial Museum, Ottawa, Canada, March 2, 1922.*

#### **Bird Records from California, Arizona, and Guadalupe Island.—**

*Phalacrocorax auritus albociliatus*. Farallon Cormorant. One specimen taken on a pond near Fort Lowell, Arizona, April 26, 1905.

*Rallus obsoletus*. California Clapper Rail. Several seen along the rocky shore at Pacific Grove, California, in October, 1916.

*Pisobia maculata*. Pectoral Sandpiper. A number observed near National City, California, the latter part of October, 1917.

*Lophodytes cucullatus*. Hooded Merganser. A male and two females observed on Smith River, near Adams, California, October 10, 1915.

*Oreortyx picta picta*. Mountain Quail. A small flock flushed near Adams, California, in October, 1915.

*Melopelia asiatica*. White-winged Dove. Three flushed from a camp site on the Pima Indian reservation, twelve miles south of Tucson, Arizona, March 20, 1918.

*Micropallas whitneyi*. Elf Owl. Two of these birds frequented an isolated cottonwood tree at Bard, Imperial County, California, in April, 1915, but on account of the density of the foliage I was unable to shoot them.

*Asyndesmus lewisi*. Lewis Woodpecker. Several noticed in large cottonwood trees at Bard, California, on April 30, 1915.

*Colaptes auratus luteus*. Northern Flicker. I have a male specimen taken at Eldridge, California, January 4, 1913.

*Aphelocoma californica californica*. California Jay. Not uncommon near Adams (seventeen miles east of Crescent City), California, during October and November, 1915.

*Molothrus ater obscurus*. Dwarf Cowbird. A female taken near Long Beach, California, June 6, 1913.

*Loxia curvirostra stricklandi*. Mexican Crossbill. A female that was taken in the Chiricahua Mountains, Arizona, would have commenced to incubate a set of eggs about August 28.

*Astragalinus tristis pallidus*. Pale Goldfinch. A few seen near Fort Lowell, Arizona, November 20, 1905, and one secured in Sabina Canyon, Catalina Mountains, December 10, 1920.

*Astragalinus lawrencei*. Lawrence Goldfinch. Specimens taken or seen at Fort Lowell, Arizona, in March, 1905; at Paradise, Arizona, in November, 1918; at Willcox, Arizona, March 17, 1919; at Santa Cruz, California, two pairs, on May 17, 1917.

*Zonotrichia albicollis*. White-throated Sparrow. I have a specimen I secured near the corral on the shore of Guadalupe Island, Mexico, on October 10, 1913; and also a male taken at Adams, California, November 4, 1915.

*Spizella monticola ochracea*. Western Tree Sparrow. A fine male specimen taken at Pacific Grove, California, October 13, 1916, is in my possession.

*Piranga ludoviciana*. Western Tanager. A male of the year which was feeding on madrone berries and with its plumage badly smeared with crude oil, was secured at Boulder Creek, California, October 20, 1916.

*Piranga rubra rubra*. Summer Tanager. I have a female which I secured in the cypress grove on the summit of Guadalupe Island, Mexico, on October 12, 1913.

*Guiraca caerulea lazula*. Western Blue Grosbeak. Two males observed feeding on wild oats near Mosquito Harbor, San Clemente Island, April 21, 1914.

*Dendroica townsendi*. Townsend Warbler. A male secured near the same place on April 18, 1914.

*Dendroica coronata*. Myrtle Warbler. A number observed near Adams, California, in November, 1915.

*Vermivora celata sordida*. Dusky Warbler. Seen in the willows on the beach at Monterey, California, in October, and at Pacific Grove, in November, 1916.

*Thryomanes bewicki drymoecus*. San Joaquin Wren. One specimen secured at Adams, California, November 1, 1915.

*Thryomanes bewicki marinensis*. Nicasio Wren. One specimen secured seven miles east of Crescent City, California, November 18, 1915.

*Riparia riparia*. Bank Swallow. A considerable colony of some kind of swallow, certainly not *Petrochelidon*, and apparently Bank Swallows, were present about an outlying rock at Alamos Landing, Santa Cruz Island, California, during June, 1914.

*Penthestes rufescens rufescens*. Chestnut-backed Chickadee. A family found in a burnt stub, eleven miles from McCloud, California, near the river of that name, on August 2, 1915.—H. H. KIMBALL, *Seal Beach, California, February 20, 1922*.

**Townsend Solitaire on the Oregon Coast.**—On February 28, 1922, a single Townsend Solitaire (*Myadestes townsendi*) was seen along the roadside near the mouth of the Miami River, Tillamook County, Oregon. This is the first record of the Solitaire in this county, and so far as I can learn the first west of the coast mountains in northwestern Oregon. It breeds commonly in the Transition zone in the Blue Mountains of eastern Oregon, and sparingly west to the west slope of the Cascades in central and northern Oregon, migrating into the Willamette Valley sparingly during the winter.—STANLEY G. JEWETT, *Portland, Oregon, March 10, 1922*.

**A Winter Record of the Texas Nighthawk in California.**—At first thought, one would hardly expect a goatsucker to tolerate more than a touch of frost, but, indeed, there is no apparent reason why a bird of this sort should not be able to gain a living wherever and whenever a Vermilion Flycatcher can. However that may be, shortly after sundown on January 23, 1922, three miles northwest of Calexico, Imperial County, California, a Texas Nighthawk (*Chordeiles acutipennis texensis*) flew a few yards above me and hawked back and forth several times above a field of lettuce. This could hardly have been a migrating bird, and its presence was all the more unusual for the fact that the given date was in the midst of the coldest weather experienced by southern California during nine years, with a third of an inch of ice at night. It is a question whether frosts are not just as frequent and as severe in the Imperial Valley as they are throughout the general area known as the "thermal belt" of the San Diegan faunal division. However, the mean winter temperature is considerably higher in the former section, due to much warmer days, and as there are probably few birds found north of the Mexican border which cannot put up with an occasional frosty night, one would expect to find more of the "tender" species lingering through the winter in the Valley than in the relatively cooler districts nearer the coast.

In the same locality on January 22, 1922, I flushed two flickers from a cottonwood by the roadside. One was the usual *Colaptes cafer collaris*, but the other was a yellow-shafted bird, and appeared to be somewhat smaller. It was impossible to tell whether this individual was a *Colaptes chrysoides mearnsi*, or merely one of those puzzlers which are variously placed as *Colaptes auratus borealis*, or as chromatic variants of *collaris*. During the breeding season, Mearns Gilded Flicker is seldom found far from the sahuaros, but in winter it scatters more widely, and for some years I have



rather expected to hear of its presence in the Imperial Valley, in common with a number of other birds which are extending their ranges over the irrigated delta of the Colorado River. Taken in this connection only, this note may prove of interest.—A. BRAZIER HOWELL, *Pasadena, California, February 8, 1922.*

**Some Winter Birds of the Colorado Delta.**—On January 22 and 23. of this year I was with a party hunting quail near Don Lorenzo in Lower California. We were from forty to fifty miles east of Calexico, and from twelve to sixteen miles south of the international line.

North of us we could see the sand hills that are still untamed if not unconquered, and beyond them the well-known mountain ranges of the desert. But we were not in a desert country at all—rather in a jungle. The true delta of the Colorado is overflow land, thickly covered with vegetation; ink-weed, rag-weed, and arrow-weed are the native names of the most common kinds. A few cotton-woods and many willows in the lower places, and the ever present mesquite patches, broke the monotony. The ground is not really level. Wind and water have combined to produce hills and depressions, and open places where sand was master were by no means rare. Still, in a general sense, we were on the edge of a flat scrubby country of several thousand square miles, covered solidly with a head-high growth that could be penetrated only with difficulty.

There was hardly a time when one or more of the *Raptores* were not in sight. When I woke the first morning a pair of Marsh Hawks were busily harrying the cotton-fields by the ranch house. Our old friend, the Western Red-tail, was conspicuously present, as were several other species of hawks and at least two species of owls besides the Burrowing Owl. Turkey Vultures were common. All of which speaks volumes for the abundance of the unseen rodent life in the brush.

The White-crowned Sparrow, in my judgment, was the most common bird, and Gambel Quail the next. Abert Towhees were seen everywhere, and the Mexican Ground Dove and the Northern Cactus Wren were very abundant, though both were outnumbered by the Western Mourning Dove. The Black Phoebe was as busy as anywhere around ponds and buildings. Ravens were plentiful, especially along the banks of the Bee River. I collected three Sparrow Hawks for the San Diego Museum.

Among other land birds observed were Shrike, Thrush, Bush-tit, Vermilion Flycatcher, Dwarf Cowbird (quite common), Road-runner, Phainopepla, Tree Swallow, and Sonora Red-wing.

On January 24 we drove back to Hecheira and then turned south. We found a slough within eight or ten miles on which we shot ducks, mostly Spoonbills. My son and I each killed one of a pair of Fulvous Tree Ducks, and were much surprised to find them so far north at this season. There was a heavy tule growth around the slough, which was the home of innumerable marsh wrens, and the Sora was more common than I have ever seen it elsewhere.

We drove on to Volcano Lake and spent one morning there. Ruddies and Spoonbills were the most common ducks. Avocets, too, were present in large numbers. I was interested in obtaining from Mr. W. G. Hendricks an authentic statement of the presence there of the Roseate Spoonbill. In the summer of 1920 a flock of about twenty were on the lake, and in the summer of 1921 four were observed. A flight of Lesser Snow Geese apparently takes place over this lake every winter.—GRIFFING BANCROFT, *San Diego, California, February 1, 1922.*

**Water Ouzel Eating a Fish.**—On January 1, 1922, I caught sight of a small, plump bird struggling with something on a snow bank across the river, a foot or so from the water's edge. The bird was recognized at once as an Ouzel (*Cinclus mexicanus unicolor*). It appeared to have a small fish in its beak, which it was shaking violently and beating in the snow. I went to the tent and got the field glasses and was able to determine that it really was a fish that the Ouzel was struggling with. The fish was about two inches long and very much alive. After beating and mauling the fish for a few moments the Ouzel would attempt to swallow it. At this juncture the fish would free itself and flop onto the snow, whereupon the Ouzel would seize it and the maltreatment would commence again. After tussling with the refractory fish for about five minutes the Ouzel with apparently tremendous effort managed to stuff the victim down. After the

final effort the Ouzel appeared stunned and dazed and too full to move. His inactivity, however, was very brief and he soon plunged into the turbulent river. His strange maneuvers with the fish might remind one of the antics of the Kingfisher when attempting to reduce his catch to an edible state.—CHAS. W. MICHAEL, *Yosemite, California, January 31, 1922.*

**Turkey Vulture Wintering at Chico, Butte County, California.**—On December 28, 1921, while riding through the Phelan Ranch near Chico, California, I saw a Turkey Vulture (*Cathartes aura septentrionalis*) circling overhead. On expressing my surprise at seeing the bird so far north at that time of year my companion, who is an old resident there, informed me that they wintered there "quite commonly". Later in the day another was seen in the same locality. Two days later, December 30, I saw two of the birds along the highway between Chico and Gridley, which seems to substantiate my companion's remark.—FRANK N. BASSETT, *Alameda, California, February 18, 1922.*

**Behavior of a Barn Owl in Captivity.**—On February 13, 1922, some boys captured alive a Barn Owl (*Aluco pratincola*), in the top of the high school building in Benicia. After passing through several different hands it was finally presented to me on the evening of the same day, and I promptly made from a box a good-sized cage for it with the intention of learning a little about the bird's habits.

As usual with owls this bird's activity was much restricted during the day. Especially on sunny days, or at night when brought into a room where there was an electric light, the bird became very drowsy and to all appearances was fast asleep. It would either stand listlessly or lie forward on its breast, as when incubating, with eyes closed and in a position to avoid the most light. Should someone approach the cage during the day after the bird had been left alone for some time, it would always arouse itself sufficiently to attempt to avoid capture, but, not succeeding, would soon settle down and doze off again and become indifferent to any amount of commotion. In fact, it could be taken from its cage, laid on its back, feet upwards, and in this position would remain motionless, its eyes closed, wings folded and claws drawn tightly together.

Towards evening and at night, and sometimes on cloudy days, it became more lively and would attempt to escape from its cage, several times succeeding. Then he had the larger liberty of the laundry, where his cage was kept; an open window covered by a wire screen kept him from getting out of doors. In the laundry he perched on one of the shelves or on a clothes-line, or else flew back and forth between the perches or towards the window, where he clutched the wire screen with his claws, held on awhile, and then flew back to a perch. When recapturing him I found it advisable to keep my hands away from his claws, as I at first got several bad scratches. If he succeeded in getting a good hold of my hand it was difficult to extract it, as he did not seem satisfied to puncture the flesh by only one tight grasp, but would loosen and tighten his grip intermittently, thus making various wounds. He never bit me, though he held his mandibles open when I was recapturing him as though threatening to seize my fingers.

One evening I brought the cage into the kitchen and placed it on the floor to observe the bird's actions. He was quiet and indifferent until a house cat came in through the back door. This immediately occasioned a display of vigorous activity on the part of the owl. As soon as he spied the cat he began snapping his bill, and let forth a series of long, shrill screams of some five seconds duration, with an intermission between each of about the same length. This was kept up for about half an hour, or until the cat left the room. During all this time, backed into one corner of the box, he kept his wings raised high above his head, his whole body swaying slowly from side to side, and eyes open to their full extent, following the cat as it moved about the room.

Much to my disappointment I had difficulty in feeding him. I placed sparrows, raw beef, liver and mice in his cage but he would not voluntarily eat any of these. I succeeded in forcing two house mice into his throat, the bones and fur of which he later expelled in pellets. He accepted a little raw beef which was also forcibly fed to him; liver he would not retain but promptly expelled it. His attitude towards food was one of indifference; he made no effort to avoid being fed and no effort to feed himself. A sparrow which I skinned and fed to him he kept down, but several others freshly killed and placed in his box he did not touch. I thought he would soon begin to eat of his own

accord, but much to my surprise and regret on the morning of the 20th, just a week after his capture, I found him dead in the bottom of his cage.

I am recording these notes in the belief that some observer who has had the opportunity of studying the Barn Owl in captivity would be interested in my experience with this individual. I have had Screech and Burrowing Owls in my possession for several days, but they all ate eagerly and voluntarily the food given them, and when released were in fine physical condition. I am wondering if the bird's behavior as reported above, especially as regards difficulty in feeding, was peculiar to this individual or characteristic of the species when kept in confinement.—EMERSON A. STONER, *Benicia, California, March 1, 1922.*

**Bird Drives in the Yukon Delta.**—In the spring of 1913, in company with Claud J. Roach, I made a trip by dog team from Bristol Bay, Alaska, to the Yukon River and back by way of the Kuskokwim River. The journey was made primarily to make certain investigations of the fur-bearing animals of the region for the United States Bureau of Fisheries, but an opportunity was afforded to make observations on other forms of life as well. Bethel, a town near the head of tidewater on the Kuskokwim, was made our headquarters for nearly two months. While there, we were greatly impressed by the vivid accounts we heard of the great bird drives which are held annually out on the Yukon delta. The stories came from so many sources, apparently reliable, and all so agreed in the essential details, that there seemed to be little doubt of the accuracy of the main features. Nevertheless, the drives seemed to be so unique that I had hoped to be able to check the statements by personal observation before making any report of them. But the likelihood of my being able again to visit the region is growing more and more remote, so it seems best to call the attention of others to the matter. Perhaps someone may be able to visit the place at the proper time to witness one of these events. Therefore, the account is repeated as it was given to us by numerous residents. I cannot, of course, vouch for the accuracy of the statements, but those who gave the information seemed entirely reliable.

The drives take place in the salt lagoons in the region south of Nelson Island. Apparently the borders of these are great breeding grounds for ducks and geese, and in August each year the young birds, almost grown but unable to fly, gather in large flocks in the quiet waters to await the maturing of the plumage before the southward flight. Their numbers are greatly increased by the adult birds, which at this season lose their wing feathers and are unable to fly. The cast-off feathers are so abundant that they form windrows on the shore lines.

The drive is made by the natives in their kyaks. Fifteen to twenty of these skin boats take part, one man to each. They beat the grassy banks and the water with their paddles and gradually drive the birds by thousands into some pocket or head where they are killed with sticks and spears with a great hurrah and much excitement. One drive in 1912 was said to have resulted in the capture of fourteen boat loads. Just how many birds this would represent is difficult to determine, but it would certainly be more than a thousand. I have seen a native take his wife, three children and several dogs, as well as his camp outfit, from beneath the hatch of one of these boats, and an estimate might roughly be made from this of the number of birds taken.

Some persons might be inclined to criticise the native for such wholesale slaughter, but they are advised to await an impartial investigation before doing so. Perhaps the people are entitled to them. The country is bleak and inhospitable; so much so that white men can scarcely get there at all. The inhabitants live much of the time upon raw food, chiefly the black fish of the interior delta lakes. Away from the coast they have no fuel whatsoever except a little seal oil which they take for their lamps. Yet they seem to be the healthiest, happiest, albeit the dirtiest, of all Alaska natives.—G. DALLAS HANNA, *California Academy of Sciences, San Francisco, March 23, 1922.*

**Black and White Warbler in Southern California.**—I note that in THE CONDOR of September, 1921, in the Field and Study department, the "sixth occurrence of the Black and White Warbler" in California is recorded. It may be of interest to CONDOR readers to know that I saw a Black and White Warbler on the trunk of an old olive tree about fifteen feet from my window on October 14, 1908. Being an amateur at bird study I

did not, at the time, know the rarity of the object of my vision. However, there is no question in my mind as to its identity. It crept up and around the trunk of one tree and then did the same on another tree, in full view from the window.—MRS. T. F. JOHN-SON, *National City, California, March 27, 1922.*

**Ring-necked Ducks in Golden Gate Park, San Francisco, California\*.**—On the morning of March 6, 1922, Mr. C. R. Thomas, of the Audubon Association of the Pacific, kindly telephoned to Dr. Barton Warren Evermann, of the California Academy of Sciences, that he had the day before seen some Ring-necked Ducks (*Marila collaris*) on one of the Chain of Lakes in Golden Gate Park. Acting upon this information, Dr. Evermann and I repaired to the scene and found the ducks still there. We found Mr. A. S. Kibbe, president of the Audubon Association, also on the ground for the same purpose as ourselves. At the time of this visit the ducks were asleep on the water with their heads laid on their backs, and, as the light was not good, it was difficult to distinguish the female of this species from the Ruddy Duck (*Erismatura jamaicensis*).

As the light was better in the afternoon I took Mr. Chase Littlejohn with me and found matters much improved on the lake. The light was just right and the birds were moving around. As a result of this we succeeded in counting seven males and twenty females in the flock. On this occasion we met Mrs. Jane Schlesinger close to the lake and had the pleasure of showing the ducks to her. Mr. Littlejohn states that this species of duck used to be quite common on the southern part of San Francisco Bay, and that he had seen many flocks of them, as well as many of the birds brought in to Redwood City by hunters. But this was the first time I, myself, had ever had the opportunity to see a flock of these ducks. Mr. Kibbe has already made a brief report of the event in the *Gull* (vol. 4, no. 3), but it seemed of sufficient importance to warrant enlarging upon and presenting to the readers of the CONDOR.—JOSEPH MAILLIARD, *San Francisco, March 23, 1922.*

**Field Notes from Riverside and Imperial Counties, California.**—On March 27, 1922, I took a nest with one egg of the Mexican Ground Dove (*Chaemepelia passerina palle-cens*) at Winterhaven, Imperial County, across the Colorado River from Yuma, Arizona. The female was incubating. I had been observing the pair for some moments. When first seen they were perched side by side on a slender branch near the nest. They then flew to the ground and copulated. The nest was in a slender willow on the edge of an irrigation ditch, about eight feet from the ground, wedged between the main trunk and one slender branch. I saw two other pairs of Ground Doves in the same general region, one of which was evidently also nesting, as the female returned persistently to the same clump of bushes.

The only other published record of the nesting of this species in California of which I am aware is that of Leo Wiley for Palo Verde, Imperial County (Condor, vol. 18, 1916, p. 230). The time of nesting is not mentioned in his note. Gilman (Condor, vol. 13, 1911, p. 54) says that the earliest nest found at Pima, Arizona, was on July 7.

Lark Buntings (*Calamospiza melanocorys*) were seen in small flocks at four different points between Banning and Yuma, feeding in washes or in open fields. One flock of about thirty birds was noted at the head of San Gorgonio Pass about a mile below Banning. On January 3, 1922, a flock of about twenty was noted at Thermal.

About a mile below Banning the last Cactus Woodpecker (*Dryobates scalaris cac-tophilus*) was noted. A single Lesser Yellow-legs (*Totanus flavipes*) was seen near Brawley on March 28, feeding with a flock of about twenty Greater Yellow-legs.—RALPH HOFFMANN, *Carpinteria, California, April 4, 1922.*

**Some Water Birds Seen in San Gorgonio Pass.**—Several species are seen regularly passing overhead during the migrations. Large flocks of White Pelicans (*Pelecanus erythrorhynchos*) go over in spring and fall. They usually fly at a great height, in V-shaped flocks, occasionally circling about for a while before going on. Wild Geese of several species appear in the spring, and Cranes (*Grus canadensis* or *G. mexicana*) go over occasionally.

The reservoir at Banning attracts many water birds. Cormorants (*Phalacrocorax auritus albociliatus*) are frequently seen there, and Mallards (*Anas platyrhynchos*) and

\*Contribution No. 147 from the California Academy of Sciences.

other ducks drop in from time to time. Of rarer species I have seen one Black Tern (*Hydrochelidon nigra surinamensis*), a young bird in first year plumage, the Wilson Phalarope (*Steganopus tricolor*) and Northern Phalarope (*Lobipes lobatus*), and one Least Sandpiper (*Pisobia minutilla*). The Spotted Sandpiper (*Actitis macularia*) is often seen about the edge of the reservoir. The Killdeer (*Oxyechus vociferus*) is common in the ploughed fields. I have seen both the Anthony Green Heron (*Butorides virescens anthonyi*) and the Black-crowned Night Heron (*Nycticorax nycticorax naevius*) hereabouts.—R. A. BRAMKAMP, Banning, California, December 21, 1921.

## EDITORIAL NOTES AND NEWS

Many years ago one of our foremost ornithologists claimed a certain species of bird as "his own", because, while it had been named by another man, he, himself, was first able to give a satisfactory description of the species. We can smile at the "claim", perhaps; today we disallow it. Of the valid credit he acquired by information given out regarding this species and many others, there is no question. The incident seems amusing now, in the general acceptance of uniform nomenclatural rules, but the lesson conveyed may still be read. To claim "credit" or "priority" will not secure it; it comes unsought if it is deserved. It is a matter of congratulation that ornithology today is practically free from bickering and jealousy between individuals, and that as a rule a spirit of mutual helpfulness prevails.

An immensely useful feature of our contemporary magazine *Bird-Lore* is the School Department which is conducted under the auspices of the National Association of Audubon Societies. Dr. Arthur A. Allen of Cornell University is editor of this department. As is to be expected under Dr. Allen's editorship, the material presented is well chosen, rigidly authentic, and couched in sober language. The educational function of the Audubon Societies, thus performed, is an exceedingly worthy one.

In *The Ibis* for April, 1922, Mr. J. H. Gurney writes "on the sense of smell possessed by birds", an article that is well worth reading. Details of observations made far and wide, on various species of birds, by many different people, are brought together, as well as arguments, for and against, in the disputed question of whether or not the sense of smell is used by birds in their search for food, or for other ends. While it is well for any ornithologist to have a grasp of what has been done in this field, still an elaborate resume of opinions and controversies (perhaps the major part of the literature on this subject) together with such obviously inadequate, frequently accidental, "experiments" as compose most of the recorded observations, should be no more than a preliminary to studies of a more conclusive nature.

Here, again, is a field for those who, disliking to kill birds, still wish to make some substantial contribution to ornithology. To carry on the discussion on the basis of the disputed observations so far placed on record, is to put ornithologists in the same class as certain clerical disputants of the Middle Ages, whose serious activities are now an unfailing subject of humor, discussing heatedly, for example, the number of legs possessed by a fly, without descending to the vulgar expedient of counting them. To carry on a series of experiments here in California, and experiments that should be conclusive, would seem to be a simple matter for anyone with a little time to devote to the subject. The Turkey Vulture, an obvious subject for such experimentation, is abundant throughout most of California. It would take but little ingenuity to devise and carry out a series of observations upon the habits of this species, based perhaps upon baits, concealed and otherwise, the results of which would explain at least the method by which this bird discovers its food. Furthermore, such experiments could be conducted without offending even the most rabid bird protectionist or anti-animal-experimentalist—without the need even of such official permits as are called for in the banding of birds.

The ornithologists of Washington, D. C., met at the home of Mr. B. H. Swales, 2921 Albemarle St., Chevy Chase, D. C., on March 14, 1922, and organized an ornithological club to be known as the Baird Club, in honor of Prof. Spencer F. Baird. Dr. A. K. Fisher was elected President, Mr. Robert Ridgway, Honorary President, Mr. Ned Hollister, Vice President, and Mr. B. H. Swales, Secretary. The membership of the club is restricted to those primarily interested in birds. Meetings will be held monthly at the members' homes, for more or less informal social intercourse.

The Cooper Prize in Ornithology (\$50.00), offered at the University of California for the best essay on any topic concerned with birds, has been won by Mr. Robert C. Miller. His thesis, "A Study of the Flight of Sea Gulls", was unanimously chosen by the

committee of award from among the several essays offered. It will be printed in an early issue of *The Condor*.

We hear that Mr. E. R. Kalmbach of the U. S. Biological Survey has been working on the problem of controlling blackbirds in the Imperial Valley. These birds have responded very favorably to the irrigation and cultivation of that territory; their numbers are now so great that damage to certain crops is reported to be heavy.

After five years of active field work in the state of Washington for the U. S. Biological Survey, Mr. George G. Cantwell, of Puyallup, has resigned, as of date January 1, 1922. During a good deal of this time Mr. Cantwell has served as assistant to Dr. Walter P. Taylor in the latter's vertebrate survey of the state.

### COMMUNICATION

#### PROBLEMS CONCERNING DESERT BIRD-LIFE

Editor *THE CONDOR*:

I have had opportunities in the last few years of studying the ornithology, and the fauna generally, of some of the deserts of the Old World. I have come to the conclusion that the desert birds are particularly worthy of study from an ecological point of view because they live in an environment which has been unspoiled by man and because their reactions to their peculiar environment are, in some cases at any rate, very easily observed. I have also come to the conclusion that the accepted interpretation of some of the most obvious features of desert life requires revision. May I appeal to your readers to send me any facts, or any ideas, which bear on such problems as the following, so that I may compare our Old World fauna with yours. Eventually I hope to publish a summary of my results.

1. The surface of the desert soil heats up to a very high temperature in the daytime and cools very rapidly at night. Do birds which nest on the ground in American deserts commence incubation as soon as the first egg is laid? Have you any birds which lay right out in the open without the shelter of a bush, as is done by Coursers, Stone Curlew and Sand Grouse with us? Some of these birds lay in May, or even in June and July, at the very height of summer, and it is difficult to see how the eggs avoid being cooked if incubation is not continuous from the date the first egg is laid.

2. I should be grateful for information as to the water supply of the chicks of desert birds. Our Sand Grouse fly a very great dis-

tance to water, once a day, and the males saturate the breast feathers with water and bring it back to the chicks, who drink from the breast. We know nothing about the water supply of other desert chicks; but one presumes that their requirements are high, because only by evaporation can they keep their bodies cool.

3. The prevalent color of desert birds is of course roughly that of their environment; this is true also of their chicks. I am inclined to think that it is not true of the eggs. The egg of such a bird as the Stone Curlew, or Courser, is of the familiar type characteristic of the ground nester, but it is not specialized in the direction of being paler or less blotchy. It is in fact a typical ground breeder's egg, not a typical desert breeder's egg. What do American oologists say?

4. We regard the sandy color of desert birds as protective, and so it is, under certain circumstances. With us, many desert birds are running about feeding in early morning and late evening; the sun is low and they cast long black shadows and are quite conspicuous. In these cases the protection must at any rate be very incomplete. Then, again, our Eagle Owl is a powerful bird, nocturnal, and found over a large part of western Asia and Europe and North Africa. Many subspecies are described, and the desert ones are all pale and more or less sandy in color. Of what possible value is this to the bird? Does the theory of protective coloration fit the facts as regards birds in North American deserts? Have you any species of birds in America which produce red forms on red desert, gray on gray desert, pale on sandy desert, etc?

I have trespassed too far on your space already. If any American ornithologist is good enough to write to me, to discuss these problems or furnish me with facts, I shall be extremely grateful. Would my correspondents remember that I am quite ignorant of American birds, and furnish scientific names, and state even the obvious facts which *you* all know?

I remain, Sir, yours,

P. A. BUXTON,

*Government Laboratory, Jerusalem, Palestine, February 27, 1922.*

### MINUTES OF COOPER CLUB MEETINGS

#### NORTHERN DIVISION

FEBRUARY.—The regular meeting of the Northern Division of the Cooper Ornitholog-

ical Club was held at the Museum of Vertebrate Zoology on February 23, 1922, at 8 p. m. Vice-president Cooper was in the chair, and other members present were: Mesdames Allen, Frederick, Grinnell, Kelly, Mead, Schlesinger and Van Gaasbeck; Messrs. Bryant, Bunker, Evermann, Grinnell, Willard Grinnell, Keeler, Mailliard, Storer, Stow and Strong. Visitors present were: Mrs. Bryant, Miss Fisher and Mr. Kross.

The minutes of the January meeting of the Northern Division were read and approved, and the minutes of the December and January meetings of the Southern Division were read.

Letters relative to the Salt Lake meeting of the Pacific Division of the American Association for the Advancement of Science were reported, and the secretary was instructed to write to officers of the Intermountain Chapter asking them to represent the Northern Division in the arrangements for, and the conduct of, a meeting at that time.

Since no reply had been received from the Regents of the University with regard to the resolution passed at the last meeting of the Division, it was voted to appoint a committee to continue protests against the destruction of Strawberry Canyon in the interests of commercialized athletics. Mr. Cooper, Mr. Stow and Mrs. Schlesinger were appointed by the chair.

Winter bird notes were then contributed by various members present, the topics ranging from the Condor to the Hummingbird. Adjourned.—AMELIA S. ALLEN, *Secretary*.

MARCH.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology on March 23, 1922, at 8 p. m. President Swarth was in the chair, and other members present were: Mesdames Allen, Bamford, Bogle, Frederick, Grinnell, McLellan, Mead, Reygadas, Schlesinger; Messrs. Bunker, Cooper, Dixon, Evermann, Gignoux, Grinnell, Willard Grinnell, Keeler, Kross, Mailliard, McLean, Ritter, and Strong. Among the many visitors were Dr. Bailey, Professor and Mrs. Holmes, Professor Kingsley, Mrs. Swarth and Mr. Thomas.

The minutes of the February meeting were read and approved, and the following names presented for membership: Mr. Charles A. Bryant, San Francisco, by Mr. Bunker; Mr. Archibald W. Bell, Berkeley, by J. Grinnell; Miss Helen Genevieve Corwin, Berkeley, by Tracy I. Storer.

Announcement was made of the probable dedication of the new buildings of the Museum of Comparative Oology at Santa Barbara in April or May, and it was suggested that any member of the Club who might be in the vicinity attend as a representative of the Club. A letter from Mrs. Treganza, secretary of the Intermountain Chapter, reported the preliminary steps taken to insure a successful meeting at Salt Lake in June. Mrs. Allen was elected to represent the Club as a judge in the competition for the Cooper Prize in Ornithology. Mr. Cooper reported for the stadium committee, and the committee was retained for final action.

Business completed, Professor William E. Ritter presented a paper entitled "Further Observations on the Activities of the California Woodpecker". After discussion the meeting adjourned.—AMELIA S. ALLEN, *Secretary*.

#### SOUTHERN DIVISION

FEBRUARY.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held at the Los Angeles Museum, February 23, 1922, at 8 p. m. President Rich was in the chair, with other members present as follows: Messrs. Appleton, Barnes, Bishop, Howell, King, Lamb, Little, Law, Pierce and Ross; and Mrs. Law. Mrs. Bishop, Mrs. Barnes, Mrs. Howell and Miss Sykes were visitors. In the absence of the secretary, Mr. Chambers was appointed secretary pro tem.

The following applications were presented: George C. Thomas, Los Angeles; Henry W. Davis, Ventnor, N. J.; Herman W. Nash, Pueblo, Colo.; Alvin R. Cahn, College Station, Texas; James Randolph Burns, Des Moines, Ia.; Mrs. Omie Stephenson, Monte Vista, Colo.; and John Elliot Patterson, Ashland, Ore., all by W. Lee Chambers. Egmont Z. Rett, Denver, Colo., and Frederick W. Miller, Denver, Colo., by Horace G. Smith. Edward H. Wagner, Stockton, Calif., by A. B. Howell. Mrs. Bertha L. Dart, Montevideo, Minn., by Dr. Warmer. Dix Teachenor, Kansas City, Mo., by Harry Harris. The names of Mrs. John L. Cole and Martin C. Paulson, of Nevada, Ia., were received from the Northern Division.

A letter from Mr. P. A. Taverner, opposing further splitting of avian genera, was read by Mr. Law, and was the cause of considerable discussion. Business concluded, Dr. Bishop talked on some birds he had recently taken in this locality. Followed a period of general discussion of bird matters. Adjourned.—L. E. WYMAN, *Secretary*.



**For Sale, Exchange and Want Column.**—Any Cooper Club member is entitled to one advertising notice in each issue free. Notices of over ten lines will be charged for at the rate of 15 cents per line. For this department, address W. LEE CHAMBERS, *Altadena, Los Los Angeles County, California.*

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## MEETINGS OF THE COOPER ORNITHOLOGICAL CLUB

**Northern Division:** 8 P. M., *fourth Thursday* of month, at Museum of Vertebrate Zoology, University of California, Berkeley. Take any train or car to University Campus. The Museum is the corrugated iron building on south side of campus just north of football bleachers.—MRS. AMELIA S. ALLEN, *Sec'y, 37 Mosswood Road, Berkeley, Calif.*

**Southern Division:** 8 P. M., *last Thursday* of month, at Museum of History, Science, and Art, Exposition Park, Los Angeles. Take car marked "University", west-bound on 5th Street (in down-town district); get off at 39th Street and Vermont Avenue. One long block east to Park. The Museum is the building with the large dome.—L. E. WYMAN, *Sec'y, care of Museum.*

**Intermountain Chapter:** Get date and place from the Sec'y, ASHBY D. BOYLE, 351 *5th Ave., Salt Lake City, Utah.*

**San Bernardino Chapter:** Get date and place from the Sec'y, M. FRENCH GILMAN, *Banning, Calif.*



# THE CONDOR

A Magazine of Western  
Ornithology



Volume XXIV

July-August, 1922

Number 4



COOPER ORNITHOLOGICAL CLUB

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Published Bi-Monthly by the Cooper Ornithological Club

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Entered as second-class matter January 25, 1922, at the post-office at Pasadena, California, under Act of Congress of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized January 5, 1921.

Issued from the Office of THE CONDOR, 770 South Pasadena Avenue, Pasadena, California

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## SUBSCRIPTION RATES

Two Dollars per Year in the United States, payable in advance.

Forty Cents the single copy.

Two Dollars and Twenty-five Cents per Year in all other countries in the International Postal Union.

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## COOPER CLUB DUES

Two Dollars per year for members residing in the United States.

Two Dollars and Twenty-five Cents in all other countries.

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Manuscripts for publication should be sent to the Editor, J. GRINNELL, Museum of Vertebrate Zoology, University of California, Berkeley, California.

Claims for missing or imperfect numbers should be made of the Business Manager, as addressed below, within thirty days of date of issue.

Cooper Club Dues, Subscriptions to The Condor, and Exchanges, should be sent to the Business Manager.

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W. LEE CHAMBERS, Business Manager, Altadena, Los Angeles County, California.

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Issued July 29, 1922

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## WITH THE WILLOW PTARMIGAN

By GRACE A. HILL

WITH FOUR PHOTOS

THE EGGS of the Willow Ptarmigan (*Lagopus lagopus*) in the vicinity of Nome hatch about the first of July. On the fifth of July, 1915, my father, James F. Hill, and I made a trip "mushing" over the tundra north of Nome to where Boulder Creek joins the Synuk. At this time we saw several broods of the downy yellow-and-brown fledglings of these Ptarmigan.

When we came upon the first brood the mother feigned a broken wing and the young hid in the tundra grass. My father caught one of the little balls of down which posed patiently in his hands while I took several photographs of it.

Shortly afterwards, as we approached a small clump of willows, we saw a female Ptarmigan struggling in the grass as though from a mortal wound. I had never seen a bird in more evident distress and could not at first believe that she was feigning. But when I came near, she ran a few feet dragging her right wing. I then turned to look for the young, the little grove presenting a likely hiding place.

Although the day was overcast, there seemed to be sufficient light to enable one to distinguish every detail in the carpet of dead leaves beneath the willows. Yet I had not taken two steps, watching carefully, when a young Ptarmigan scurried literally from under my foot-fall. Startled, I watched intently as I took another step; and again one of the birds just escaped being trod upon. Evidently I was standing in the midst of the Ptarmigan's brood, but could not distinguish a bird until it moved. My attention focused upon a spot a few feet from me. Gradually the outline of a fluffy, unblinking birdling became pricked upon my vision. His camouflage against the brown and mottled background of faded leaves and twigs was perfect.

I cast my eye about to find the rest of the brood. Having no success I glanced back to the spot of my discovery. The bird was gone. I gave the laurels to Nature and quietly crept from the field of action.

Five weeks later we again visited Boulder Creek. We were told by two miners who had spent the summer on the creek, that the Willow Ptarmigan had congregated in the creek-bed until there were, they estimated, over four hundred Ptarmigan in the vicinity of their camp. These men told us how the female birds with the more than half grown young trailed up and down the stream look-



Fig. 29. WILLOW PTARMIGAN AND BROOD ON THE NINTH OF AUGUST, 1915, NEAR NOME, ALASKA.



Fig. 30. FLOCK OF PTARMIGAN MAKING A DIGNIFIED RETREAT BEFORE THE CAMERA. THE PROTECTIVE COLORATION OF THE BIRDS AT THIS SEASON AND IN THIS ENVIRONMENT IS ALMOST PERFECT. SIX BIRDS ARE TO BE FOUND IN THIS PICTURE.

ing for food, and paid little attention to the mining operations which went on all day within a few feet of their course.

Being instructed as to a likely spot for a picture I opened my camera and sat down. I had not long to wait. A low talking, as of a domestic hen and her chickens, told me of the advancing brood. When they came in sight the talking ceased and the mother bird who led the procession gave some slight indication of uneasiness, but they moved on leisurely. The flock consisted of the female



Fig. 31. THE WILLOW PTARMIGAN IN WINTER  
IS AN IMPORTANT SOURCE OF FOOD FOR THE  
ESKIMOS.

and five young. At this season the birds were almost an exact counterpart of the stream bed.

When I arose and approached for a nearer picture, the birds paused a moment, as though to contemplate, and then decided to cross the little stream. This each did with a short easy flight, and the brood proceeded up the incline on the opposite side without the least display of undignified haste. I pressed in my pursuit and got a picture just as they disappeared under a clump of willows.



They did not manifest any more, if as much, fear as biddy with her chicks might have shown.

In the autumn when the birds begin to molt they frequent more the open tundra than the stream beds. The color of the tundra at this time is perfect for the protection of the birds. The first white feathers of the Willow Ptarmigan



Fig. 32. TUNDRA BACK OF NOME, ALASKA, THE LAST OF AUGUST. THE WHITE COTTON-GRASS AIDS IN THE PROTECTIVE COLORATION OF THE FALL MOLT OF THE WILLOW PTARMIGAN.

appear about the head. At this season the tawny, tundra grass (*Eriophorum polystachyum*) is bearing its white, cottony plumes. So, while it is still warm and sunny, and there is yet no hint of snow, the Willow Ptarmigan may begin to change his coat in perfect safety.

*Pullman, Washington, April 22, 1922.*

## FURTHER OBSERVATIONS ON THE ACTIVITIES OF THE CALIFORNIA WOODPECKER

By WILLIAM E. RITTER

DURING the year that has passed since my former communication (Condor, xxiii, 1921, pp. 3-14) to the Cooper Club on the food habits of California's widely known woodpecker (*Melanerpes formicivorus bairdi*) quite a number of new facts have come to light concerning the economics and general ways of the bird. Some of these have come from other workers and some from my own efforts. The facts and conclusions by others have reached me partly through publications and partly through private correspondence; and I gladly take this opportunity for testifying to the scientific usefulness and personal satisfaction there is in such helpful response as my published communication brought.

I may as well mention right here the publications and the correspondence that have furnished facts and ideas upon which I now draw. Three articles in THE CONDOR for July-August, 1921, contain items later to be referred to. These are: "The Storage of Acorns by the California Woodpecker", by Henry W. Henshaw; "The Storage of Almonds by the California Woodpecker", by Claude Gignoux; and "On the Acorn-storing Habit of Certain Woodpeckers", by Morton E. Peck. Then an important paper, which should have been cited in my previous paper, is: "Food of the Woodpeckers of the United States", by F. E. L. Beal (Biological Survey, U. S. Dept. Agric. Bulletin no. 37, May 24, 1911). The correspondents whose letters contain information that will be utilized, are Mr. John McB. Robertson of Buena Park, California, and Mr. A. B. Howell, Pasadena, California.

My own observations made since the former communication pertain to the same region, that of which Cuyamaca Mountain is the center, and which is the locus of this entire series of studies. Short visits were made to the locality on August 27-28, and November 19-20, 1921. And seven days were spent in camp among the woodpeckers, at Cuyamaca Lake, September 28 to October 6, 1921. As this period was timed for the acorn harvest by the birds, it yielded some of the freshest, most interesting observations it has yet been my privilege to make.

Before passing to the subject matter proper, it is desirable, I think, to be a trifle more specific than I was on my former appearance before the Club, as to the wherefore of these studies. Abiding and lively as is my general interest in bird life, and, for that matter, in all out-of-door natural history, I fear I should not have given as much time and effort to these woodpeckers as I have but for my belief that doing so would bring light upon a question that has loomed large in my mind of late years.

In my earlier paper I went no farther toward stating this question than to remark that it concerns the efficiency of instinctive activity, and so belongs to the vast and vital province of adaptation. Concerning such activities I asked, "How near to perfection is their adaptation?" The further formulation of the question which it now seems best to make, may as well start from the specific statement of it.

The very idea itself, of adaptation, implies, you notice, degrees. To adapt

means to fit as a shoe to a foot or a key to a lock. But, so far as one can see, no such idea and word to express it, would ever have arisen if everything fitted *absolutely*. If we are to have any real idea of adaptiveness or fitness, we *must* apply the good, better, best criterion to it. Otherwise expressed, the idea of fitness is *composed of these degrees*.

Now so obvious is this, once one thinks over the matter a little, that it is surprising to find how frequently thought and expression ignore partly or wholly this gradation in its excellence, even when speaking of adaptation. The ignoring is particularly apt to occur in theoretic discussions of evolution and natural selection. One hears repeatedly that an individual or species is adapted, or is not adapted, and consequently survives or does not survive. The idea of being more or less well adapted, and hence of surviving more or less well, comes far less definitely into thought than into the actual processes of nature. This discrepancy in our conceptions is largely due no doubt to the great difficulty of getting exact quantitative information in any given instance as to how much departure there is from perfect adaptation; as to how much falling short of complete survival there is; and as to the rate at which improvement is made. And the difficulty of getting such information is clearly due in large part to the exceeding complexity of evolutionary phenomena and the slowness with which, generally speaking, they go on.

Try to imagine, even in an approximately statistical way, the main changes involved in the evolution of such a relatively simple thing as the pelican's scoop-net, and see where you come out. Notice that you have only some hypothetical *qualitative* data, to say nothing about exact *quantitative* data, even to make a start with. But suppose yourself satisfactorily started, from, say, a slightly developed gular pouch like that of the cormorant: What next? What exactly *measured* structures and functions between the slightly developed cormorant stage and the highly developed pelican stage is there in your imaginary statistics?

We must come to the main point of this little preliminary.

I take it for granted that no naturalist, especially no field ornithologist, doubts for a moment that the activities of animals are quite as subject to the principle of adaptation as are any of their structures. This being granted what I want to say in a nutshell is that the problem of adaptation in animal activities, particularly in animals of median rank, as for example in many insects, many birds, and many mammals, is, I believe, amenable at certain points to much more satisfactory attack by scientific research than it is in connection with animal structures. This is so because many activities adapt themselves much more quickly and widely than do the vast majority of structures.

A familiar case will make the meaning clear. Take the enormous variety of activities of which the human hand is capable. Think of the difference both as to the action itself and as to the results, between the hand work of a skilled pianist and a skilled watch repairer! Yet the structural difference in the hands in the two cases is very slight, relatively.

But would any one question that great numbers of hand activities are as truly adaptive as were the structural changes involved in the production of the hand originally? And almost any organ of almost any animal shows something of this lack of close coincidence between structural and functional adaptation. Indeed, so much more responsive to changed conditions, so much more pliable, so

much *more* adaptive, are animals by way of their activities than by way of the organs which perform the activities that one is led to conjecture some deeper relation between structure, activity and adaptation, than our rather easy-going evolutionary philosophy usually recognizes.

But woodpeckers and not philosophy is our subject now. It is hoped, however, that these remarks will light up somewhat the background of further observations on the particular way in which these birds solve their problem of existence and the degree of success they achieve.

I will present the new observations under three captions. (1) Those which necessitate some modification of conclusions suggested by my former communication. (2) Those which confirm and extend previous conclusions. (3) Those which bring grist that is entirely new to the scientific mill, so far as these studies are concerned.

(1) My previous surmise that the birds are more interested in the grubs contained in the acorns than in the acorn meats has not been substantiated. What I could make out while in camp among them, by watching them gather and eat their breakfasts, was to the effect that good, uninhabited acorns were chiefly used. Again and again birds were seen to pick nuts from the top-most branches of the black oak, fly with them in their beaks to some approximately horizontal surface of a large limb on a pine or another oak, make the surface aid them somehow (I never could see exactly how, as the "breakfast tables" were, of course, all on the upper surfaces of the limbs, and too high for my vision) in breaking and tearing open the nuts. Apparently cracks and chinks in the table top serve as holders for the acorns while they are being opened and eaten. This is indicated by the fact that dead and partly decayed trees or parts of trees were mostly used. I saw no indication of the feet being used in handling the nuts.

The litter on the ground under the dining trees, consisting of shell fragments and lost bits of meat, indicated grubless nuts almost entirely. This result as to the use of mast is in agreement with Beal's examination of the stomach contents of our woodpecker; with which, as previously mentioned, I was not acquainted when my former paper was written.

But these observations should not be taken to prove that acorn grubs are never eaten. They undoubtedly are to a large extent. How far the one kind of food or the other or both are used and under what circumstances, is the only question. And, be it noted, the question is one upon which field data enough for statistical treatment could undoubtedly be gathered were one to set about it seriously.

Another of my earlier surmises not confirmed when the opportunity came to watch the birds at work, was that the stored acorns were mostly picked up from the ground. In no instance did I see nuts thus gathered, while I did see great numbers taken from the trees. But here again this by no means proves that gathering from the ground never occurs. The indications of such gathering given in my former paper still stand and the possibility of both being used accords with the general ability the birds have of accomplishing the same ends by different means.

In my previous report I stated that I had never seen living oaks used as store houses. This no longer holds. Some of the large Live Oaks in the vicinity of Oakzanita on the road from Descanso to Cuyamaca are largely thus used. The significant point in this is that where no pines (or cedars, for these are used to

some extent on Cuyamaca Mountain) occur, but oaks abound, the oaks are utilized. And the utilization of this oak, with its hard, rough-surfaced bark, when no relatively soft, smooth-surfaced pine bark is available, illustrates again a considerable measure of adaptableness in the birds.

(2) The conclusions previously reached that have been confirmed and extended by the later observations are fortunately more numerous and, I think, more important than those that have needed modification. The point which may be mentioned first concerns the extent of the hole drilling. Summing up on the point in my former paper I said: "While the holes are made expressly for the reception of acorns, many holes are probably made which are never used . . . and large numbers of perfectly serviceable holes seem to be abandoned even in localities where both birds and acorns are abundant, and new holes are being made." My later observations substantiate these statements as fully as to leave scarcely a trace of doubt. And Henshaw reaches the same conclusion.

To detail fully my own new evidence would require more time than could justifiably be devoted to it. I will consequently merely describe briefly two perfectly illustrative even though somewhat extreme instances.

In the group of storage trees adjacent to Cuyamaca Lake, which has been the center of my observations since 1918-19, are three pines, which, though as closely be-punctured with holes as any of the others, and though well-stored in previous harvests, received not an acorn during the harvest in 1921; and this in spite of the fact that these trees, especially one of them, were surrounded by oaks well laden with the same acorns which the birds were gathering and storing in other near-by storage trees.

Here were previously-made, good holes a-plenty, acorns a-plenty, and seemingly, woodpeckers a-plenty. But not a single hole received an acorn. So far as I could see, and I watched rather closely, the birds took not the slightest notice of these particular trees. And this might appear the more incomprehensible in that the discarded trees were more secluded from campers and other people than were five other trees that were being well stored.

In contrast with this the following: Some two or three miles from the lake stands an old dead pine nearly all of the branches and bark of which have fallen off. My August visit to this found its smooth, solid surface punctured with a very large number of holes so fresh that almost certainly they had been made during the present summer. Not only were there no acorns at all in these holes, but, looking carefully as I could on the oaks round about, I failed to find a single tree that was bearing more than a mere scattering of nuts. The acorn crop in this particular locality was almost nothing this year.

Taking the evidence at its face value, this is what we have in such a case: In one locality many hundreds, thousands probably, of perfectly good holes in trees standing right in the midst of an abundant acorn crop, yet not one of these holes used. In another near-by locality scores, probably hundreds, of new holes drilled in a tree having no acorn laden oaks round about it, so, for much better reasons, not one of these holes used either.

So much out of the plenty that might be given as evidence that the adaptiveness of hole-drilling by these woodpeckers falls a long way short of perfection.

Concerning the storing itself, my previous report reads: "While this is of distinct service to the food necessities of the woodpeckers, the instinct sometimes

goes wrong to the extent of storing pebbles instead of acorns, thus defeating entirely the purpose of the instinct."

On this point I have no observations of my own. But two more undoubted cases are reported by other persons. One of these is by Mr. A. B. Howell of Pasadena, California; the other by Mr. Henshaw in the article mentioned above. Besides the four definitely known cases of this blunder now on record, several others have been reported to me, but not with sufficient positiveness to warrant regarding them as evidence. It seems, consequently, that it is a maladaptation that is not so very rare.

In connection with the case observed by Henshaw the author makes a comment so interesting that it deserves quoting almost in full. We read:

This apparently nonsensical departure from the acorn storing habit is by no means entirely devoid of significance, and forms an interesting example of a useful habit gone wrong. . . . California is remarkably well supplied with oaks, and the valleys, foothills, and mountains each have their own species. Nevertheless, not every year is an acorn year, and some seasons the supply of mast is very small indeed, or altogether wanting. It chanced that there was a very poor crop that year about Los Alamos, and, acorns being for the most part wanting, the birds took the readiest substitute. The storage habit, developed through thousands of years, has now become imperative, and, as the birds have to store something in the holes already suggestively prepared, they take the most convenient substitute, quite oblivious of the fact that the stones have no food value nor, indeed, any value whatever to the storer, except that arising from the pleasure of storing them. . . .

To say all that aches to be said with these remarks by Henshaw as a starter would require some long chapters in a large book. Indeed a book having as title "The Natural History of Intelligence" has occupied nearly all my writing time for a year and bids fair to consume another year. This book might be characterized as rotating upon an axis around the chief matters touched in the remarks.

Obviously, then, discussion here of the points raised is out of the question. All I wish to do with reference to the subject is to make sure of not passing it by and thus giving the impression of being unconscious of its importance; and to call attention to one difficulty presented by Henshaw's very plausible, and, I believe, largely correct, explanation of the abortive performance by the woodpeckers.

He assumes, you notice, that the pebbles are accepted as a substitute for acorns, their uselessness not being perceived at the time of storing. Now the question naturally arises as to why the birds should not discover the uselessness of the stones at the time of gathering them. Perhaps Henshaw's idea is that the mistake is never discovered; but he is not explicit on this point. Surely, however, the discovery would be made some time, for instance when, the next winter, the stored acorns or starvation should be the only alternatives before the birds. And that such a narrowing of alternatives may happen is made highly probable by the events of the very winter just passed. Snow to the depth of many inches, even feet, fell on three separate occasions over all home territories of these woodpeckers in southern California during the winter. And this snow remained on the ground for days on one of these occasions at Cuyamaca and was there accompanied by a layer of ice on much of the surface of the lake.

To my very keen regret I was unable to visit Cuyamaca during the snow periods to see how it was faring with my birds. But there is little doubt that if the group I saw storing acorns last fall, or some other group, were there through the times of snow and ice, their lives depended largely if not wholly

upon the stored nuts. But I am wandering from the main point, namely, that of why the poor birds should not recognize the folly of picking up stones and putting them away for food *at the time* the folly is committed.

Saying nothing about their faulty observation as to the difference in weight, shape, color, etc., between acorns and pebbles, even the most acorn-resembling ones, I raise this further question on the strength of my own observations: Is it likely that pebble-storing birds never try to eat the pebbles during the very time that they are gathering and storing them? The fact that the birds I saw storing acorns last fall were at the same time feeding on the nuts makes me strongly but sadly suspicious that pebble-storers would also try simultaneously to feed on their gatherings and would go right on storing them for future use in spite of their demonstrated uselessness.

I fear we must conclude that while these birds know enough about their own welfare not only to ask for acorns, but, under normal conditions, to give themselves acorns, under conditions more or less abnormal, they ask for acorns but give themselves **stones**.

At any rate, whatever the detailed interpretation we put upon these apparently not very rare cases of pebble storing, we can not, so far as I can see, avoid recognizing in them serious imperfection in the adaptiveness of the food storing habit. This is the point where it should be mentioned that the birds sometimes store other nuts than acorns. Mr. Robertson, mentioned as one of my correspondents, tells of the storage of English walnuts at Buena Park, California; and Mr. Gignoux reports, as indicated by the title of his article already quoted, the storing of almonds in the region of Marysville, California.

This turning of the birds from their ancestral nut crop to other kinds of nuts entirely new to them, might be put to their credit as evidence of their resourcefulness in finding new kinds of food. It should be said, however, that as yet evidence is lacking that the newly found nuts are actually used as food, while in the walnut instance reported by Mr. Robertson the evidence seems conclusive that they were not so used. The birds disappeared from the scene of their activities soon after the storing was done, Mr. Robertson says, and never returned so far as he knew, the walnuts being finally "eaten by ants and other insects."

Another conclusion previously reached about the storing business was summed up thus: "Large numbers of acorns are sometimes stored, the use of which is so long delayed that the acorns become wholly or largely unfit for food, and this where the bird population seems normal."

This conclusion has been strengthened not only by finding on my last visit the same old spoiled acorns described in "storage-tree A" of my former communication, but by finding several other trees not seen before, containing rotten and half-rotten nuts. This was particularly striking for a tree found at Pine Hill, fifteen miles to the north of Cuyamaca. Details of the additional instances of this sort we need not linger on here, so similar are they to what was set forth on the point in my earlier publication. Only this deserves to be added: Later observations indicate more loss of acorns than I previously recognized from their being covered up and fused into the holes by the pitch of pine storage-trees. The aggregate of loss from this cause is far from insignificant, so it seems.

But a long way the most interesting addition to what is known about bad business by woodpeckers in food storing comes from Mr. Peck's communication



mentioned above. This relates to another subspecies (*Melanerpes formicivorus albeolus*) of the genus to which our bird belongs, and which lives in British Honduras.

Not only do the Central American birds store acorns in drilled holes as do the Californians, but in addition they make much use of hollow trees; and it is in connection with this last way of garnering that Mr. Peck's contribution is especially interesting. "I have seen," he writes, "a hollow pine tree with a cavity six or eight inches in diameter filled for a distance of nearly twenty feet with acorns dropped into a good sized hole at that distance above the ground." Such acorn-filled trees, he says, are not uncommon. Each tree-full represents, Mr. Peck believes, the accumulated gatherings of several years. And we read, "Sometimes an opening at the bottom showed the earlier acorns deposited, completely decayed and crumbling to dust."

Furthermore the author narrates that acorns are sometimes stored in houses in such fashion that "it would be utterly impossible for the birds ever to make use of the acorns in any way."

Besides this storing in quantities and places such that utilization of the material would be impossible even were it needed, Mr. Peck believes that food conditions in British Honduras are such as to make storing quite unnecessary. And he remarks, much to the point: "These instances show how an over-developed instinct may lead to actions not only useless but highly absurd." My only comment on this statement is that, speaking strictly, such performances are due not so much to *over-developed* as *under-inhibited*, or *badly controlled* instincts.

One more question raised by Mr. Peck, suggested by his doubts as to whether storage is needed at all in the midst of the tropical bounties of Honduras. All the facts taken together suggest, he says, that the "Central American bird was derived from the more northerly form or from northern ancestry, which acquired the instinct under conditions like those now existing in California, and that, as it pushed gradually into the tropics, it retained the instinct long after it had ceased to be of any utility." But, sagely remarks Mr. Peck in conclusion, "Such speculations are of doubtful value." So far as this popular type of speculation concerns the origin of maladaptive instincts its usefulness is not only doubtful, but, unless indulged in with great caution, is positively harmful.

My reason for referring to the matter here is the opportunity afforded for making a quite different point from that of the *origin* of instincts, namely that of their *persistence* beyond their usefulness.

Whether the absurd performances of these Central American woodpeckers are really an instance of such persistence does not matter for the point I wish to make. Almost certainly many, many instances of it do occur both in creatures below man, and in man; and the point I wish to make very particularly is that the inhibition or control of them to prevent their resulting in absurd performances, is exactly part of the function of intelligence. Such activities are often excused or palliated on the ground that they are instinctive and natural; and hence must be accepted as a sort of Fate, however absurd or even harmful they may be. But what I wish to insist upon is that *nature herself* has provided, or more strictly is providing, the necessary remedy, this being the very phenomenon we name intelligence. Nowhere do we find greater willingness and facility in correcting destructive processes than in nature. Intelligence is sometimes

defined as the ability to form associations. But this conception of it misses its very kernel. Not the ability to *form* associations, but the ability to use them after they are formed, for the well-being of the organism, is the cream of intelligence, as I understand.

Association-formation is of the quintessence of life itself; and intelligence plays the secondary, though vastly important role of making the associations serve the needs of the organisms, individual and racial. Marvelous though Intelligence is, as one of the nature's masterpieces, Life is still more marvelous.

But I must stick to my text—Woodpeckers—and not get shunted off into philosophy. Perhaps, however, this little shunt is not wholly amiss. It would not be if perchance it should help us more appreciatively to understand the varied and subtle ways nature has not only of preserving but of improving her processes.

Several other points at which the later observations have confirmed the earlier must be passed by in the interest of brevity.

(3) The entirely new matter (for these studies) must now be turned to. The first to be mentioned is the discovery of an adaptation in the storing business that is new to me at least, and came to me as a genuine surprise and had to face considerable incredulity before it won a secure place in my mind. This discovery is that to a certain extent *the store holes are made to fit the size of the acorns they are to receive.*

Although I had heard intimations of this sort of thing I had not seriously considered it until the evidence forced itself upon my attention. Briefly stated the facts are these: In the Cuyamaca region acorns of two species of oak are chiefly used. These are the Black Oak (*Quercus kelloggii*) and the Live Oak (*Q. wislizenii* or *Q. agrifolia*). The nuts of the Black Oak are sharply larger, especially in thickness, than those of either of the other species. Thus,  $11 \times 25$  mm. is about the average measure of black oak nuts, while  $10 \times 28$  mm. would not be far from the average of those of the other species, as I have found them in the Cuyamaca region.

In order to exhibit the evidence which establishes the above conclusion, a few sentences about the distribution of oaks and pines in the field of observations are necessary. The black oak and the Jeffrey pine used chiefly though not exclusively for storing are very nearly coincident in occurrence in the localities of observation; while the live oak, though mingling rather extensively with the other species, belongs characteristically to lower elevations. As a consequence, where the live oaks are at their best there are no pines at all. Then there is an intermediate zone or belt where in certain localities pines and well developed live oaks intermingle, but where there are no black oaks. In these localities, consequently, conditions are right for using pine trees in which to store live oak instead of black oak acorns. And this is done.

It will be noticed that holes into which live oak acorns (10 mm. average diameter) would fit closely would not admit the black oak nuts (17 mm. average diameter) at all. Now simple inspection recognizes very clearly that storage pines, at the elevation at which black oaks abound almost exclusively, have very few holes indeed too small to admit the nuts of these trees.

On the other hand mere inspection of "granaries" at lower elevations where live oaks abound give the strong impression that the holes average considerably smaller. And measurements confirm this impression. Thus the average diame-

ter of holes at the upper, or black oak elevation is not less than 20 mm.

The following table gives the diameters of "random sample" holes on three trees at the lower elevation where live oaks largely prevail:

	13 mm.	16 mm.	20 mm.	22 mm.
1st tree	35 holes	11 holes	14 holes	1 hole
2nd tree	46 holes	16 holes	14 holes	1 hole
3rd tree	53 holes	8 holes	1 hole	1 hole

These measurements make it in the highest degree probable that, in general, smaller holes are made for the slimmer live oak nuts. The quantitative data were obtained on my visit of August 27-28, 1921, which was before the year's harvest began; so very few indeed of the holes on the trees examined contained nuts or even remains of nuts.

But the visit of November 19-20, shortly after the harvest was completed, furnished the clinching information, for one storage at least. This tree was well down to the edge of the pine zone, consequently where live oaks largely predominate. I copy from my notes almost verbatim: "An enormous number of nuts, apparently all of live oak, many of them in brand new holes. Vast majority of the holes small, just large enough to admit the slim nuts. A few larger holes scattered among the small ones, but none of them so far as I can see containing nuts. This distribution of size of nuts relative to size of holes is very striking. Not infrequently the long slim nuts put side-wise into chinks in the bark; but seemingly never into the large holes."

That there are real advantages in this fitting of hole size to acorn size there can be little doubt. For one thing acorns which fit snugly into clean-cut holes as was especially the case in this tree, would be better protected against both rain and marauding mammals than would those merely thrown, so to speak, into over-sized, ragged holes.

Again, there would be a saving of labor in the making of holes no larger than the actual necessities call for. It must be confessed, however, that in view of the abundant evidence of fruitless work by these birds, one may well question the potency of this advantage. It does seem, though, that it may count for something when the hole drilling has to be done in the bark of the live oak, which is much harder and rougher than is the pine bark. And there is no question that in the field of these observations, the live oak holes made for acorns of the same species, present this size adaptation.

The question of how such an adaptation is brought about is important but impossible to answer because of the meager information. Two possible approximate explanations suggest themselves. First: One and the same bird may pass back and forth between the black oak and the live oak regions and drill large holes while in the former and small holes while in the latter. Second: One set of birds may become localized in a black oak region and another set in a live oak region, so that holes of different sizes as noted would be the work of different birds. On the basis of what we know in general about the intelligence of these birds, the latter explanation would seem most probable; but it is at this point that information fails us.

The birds surely do not restrict their acorn-gathering to oaks in the immediate vicinity of the storage trees. There is evidence of several sorts to this effect, the most conclusive of which is the fact that I have seen them in the act of carrying nuts for a distance of half or three-quarters of a mile. But this distance is

small in comparison with the eight or ten miles which separated the large-hole from the small-hole trees as indicated above.

However, observations of quite different character suggest rather strongly, though they do not prove, that the birds do at times move about for considerable distances. These observations I now present in brief, not, however, so much for their bearing upon the general economic problem, as it may rightly be called, of these woodpeckers in the Cuyamaca region. The problem concerns the abundance and distribution of the acorn crop from one year to another and in the same year.

The black oak acorn crop was bountiful in 1921 in a small area on the south side of the lake, but was almost nothing in any of the other areas I was able to visit. Of the several hundred trees which I examined more or less carefully between the lake and Julian and Pine Hills, a distance of about fifteen miles, not a single one was well loaded, and very few indeed bore any nuts at all so far as I could see.

And quite similarly was it with both black and live oaks in the opposite direction from the lake; that is, toward Descanso distant about twelve miles. Although I devoted considerable time to inspecting many trees over several square miles, I saw surprisingly few nuts—though obviously the birds were more successful in finding them, in at least a few places, than I was, for as already shown they were able to garner in a good supply of live oak nuts for a few storage trees far from the lake.

And this distribution of abundance of acorns certainly corresponded closely with the abundance of birds during the harvest period. I saw more birds on the square mile, more or less, at the lake where the acorn crop was good than on all the rest put together of the twenty or more square miles covered by my examination. So far as I could determine there were something like two dozen birds at work in the area adjacent to our camp during the week of our sojourn there: and I surely did not see as large a number in all the rest of the area. It must be said, however, that my observations were much fuller on the lake area than anywhere else.

Now this distributional state of things, both as to acorns and birds, strongly suggests, as already hinted, that the birds had gathered into the small area of abundant crop from many miles around. And this suggestion has a clear bearing on the question of what birds drill the different sized holes.

These observations and reflections on the general economics of our woodpecker, fragmentary though they are, yet suffice to call attention to a research problem in natural psycho-biology which appeals to me not only as fascinating, but as promising rich returns for any one who would take it up and follow it up in dead earnest. The concatenated queries involved fairly strike one in the face so sharply do they stand out: and they seem numberless.

Take those connected with the acorn crop, for example. What about its variation from year to year, and from place to place in the same year? What part do heat and cold, wetness and dryness, and other climatic factors play in the business? Are there really barren oak trees as well as barren fig trees, in nature? And what of the various nut moths that depend upon acorns for their existence? How hard are they on acorn production and so upon the oak forests; and how much harder on acorns and oaks would the insects be if the woodpeckers were not in turn hard on the insects?

It is impossible for anybody to understand the character even, to say nothing of the substance, of the major problems of psycho-biology *who knows little or nothing about them from the standpoint of what has been aptly called the "web of life."*

There remains only a few minutes in which to speak on the most interesting part of these "further observations"—the part, I mean, which has to do with what I saw the woodpeckers actually doing. To me, at least, this is the most interesting part largely because I had never before seen them "on the job." My desire of long standing for a chance to watch the birds at work was whetted by Henshaw's remark that the varied things done by them "bear no resemblance to work in the ordinary sense of the term, but is play." Perhaps this view interested me especially because at the time of reading it I had lately been going somewhat extensively into the literature of play.

During the first three days in camp it rained almost constantly and the woodpeckers "laid off" completely from harvesting and were seen very little. On October 2 it stopped raining about noon, and work was begun promptly and vigorously. Three storage trees within easy stone's throw of our tent gave ample opportunity for watching—especially since several oaks well acorn-laden were also near by. All the harvesting I saw was from the tree tops directly. In no instance did I see nuts picked up from the ground. In fact the birds hardly came down to earth at all.

One of the first things to attract my special attention in connection with the birds was the slight attention they paid to me. I found I could sit on a rock within a few yards of a storage tree and watch the operations to my heart's content without seeming to be so much as even noticed by the busy bodies.

#### HOLE DRILLING

I will speak first about the pecking business; and a quotation, nearly word for word, of one entry in my notes will tell the story better than I could tell it otherwise.

In two instances particularly birds on side of tree trunk pecked hard for several minutes in same spot, apparently at hole-drilling, but too far up tree to permit seeing exactly what was being accomplished. One of the two birds almost certainly working in a hole, whether old or wholly new I could not be certain. After long pecking this bird quit, ran out on near-by branch of tree, pecked a little there, ran back to trunk, hitting a few raps in one place then in another. This more or less indeterminate pecking extremely characteristic, every bird doing some of it wherever alighting, on trunk, or limb, and whether having come to the tree empty-beaked or after having put away its acorn.

The other long-time-pecking-in-the-same-place bird just mentioned finally flew away as a third bird came with a nut in its beak. This nut deposited very near to where the just-flown bird was pecking. The arrival may have placed its nut in the hole made by the other bird, but this uncertain.

This came as near as anything I saw to supporting the conjecture that the birds cooperate so specifically as to make some individuals hole-drillers while others are harvesters and stors. Everything else seen—and there was much of it—indicated that all workers peck holes and all gather and stow away nuts; and that no storer has special holes on the same tree or has any special tree at least if several storage-trees are near together.

## ACORN-GATHERING AND STORING

Since the acorns are almost invariably placed in the holes butt-end out, and since the butt is, of course, always lodged in the cup as long as the nut is on the tree, it follows that somewhere between the picking of the nut and the storing of it the nut must be turned end for end. I was unable to see where or how this is done.

In no instance did I see an individual deposit its acorn at once and at the place of alighting, even though any number of empty holes might be at the place. The bird may light on a branch and, after a little delay, run along it to the trunk, where alone, so far as I have seen, the nuts are stored. Or the trunk may be the lighting place and considerable running about done upon it before the nut is finally disposed of. In one case particularly, the laden bird lit within a few feet of the ground, started immediately up the trunk, and scarcely halted until it reached nearly half way to the top, passing on its way dozens of empty holes.

Quite as frequently as otherwise, the nut is placed in a hole and left for a moment, then taken out and carried on to some other locality. Almost always the nut is hammered more or less after being placed in the hole, this being done even though the hole is large enough and deep enough to admit the nut completely and more too, without forcing. But not infrequently nuts are placed in holes not quite large enough or deep enough to take them in all over. Reference was made to this fact in my previous report, and attention called to the exposure of such nuts to the depredations of other nut-eating creatures such as squirrels. Why nuts which slip into the holes easily to well below the surface of the bark should be thoroughly hammered while others even though hammered are nevertheless left sticking out considerably, is not obvious.

About the most surprising performance I saw connected with the storing was the taking of nuts from holes where they had previously been left and inserting them in other holes some distance away. The first few instances of this noticed seemed so strange that I doubted whether I was "seeing straight".

It seemed likely that the nuts taken out were really those just put in but not yet satisfactorily placed, for, as just indicated, this sort of thing was the rule rather than the exception. But more careful attention removed all doubt. Quoting from notes: "Bird with acorn alighted directly on tree trunk, ran up a little way, inserted acorn; ran up a little farther, picked out another nut, ran up still higher and deposited this second nut".

These narrations on hole drilling and acorn-gathering and storing could be elaborated much farther; but as they are fairly illustrative of all I saw, this is unnecessary.

Reverting now to Henshaw's idea about the character of the whole performance, I should say that while work in the narrower sense of human industrial activity would not be an appropriate name for what the birds do, neither would play in the narrower sense of human pass-time activity.

In the first place acorn harvesting by the birds has reference to a definite, future need of the creatures, no less certainly than does grain harvesting by men. From the standpoint of prospective significance the two are so much alike that there seems no real ground for not calling them both work if either is so named.

In the second place there is a kind of persistence, or fidelity to the task, about both woodpecker acorn-harvesting and human grain-harvesting that does

not seem to belong to real play. Undoubtedly, the play of children and animals is often very strenuous and persistent. Nevertheless it has a sign of irresponsibility upon it that human harvesting and, so it seems to me, woodpecker harvesting do not have.

The quality in the woodpecker work which, as I imagine, reminded Henshaw of play is a certain indiscriminateness or diffuseness of the activities. Certainly there is no meagerness, no stinginess about them. But there is lots of uncertainty as to their direction and application. Consider the pecking, for example. The amount of unconcentrated effort that a bird makes as it runs about on the side of the tree trunk, or on the larger branches, delivering one or two whacks with its beak here, four or five there, in an old hole seemingly long since finished, or in no hole at all, makes an observer wonder whether any individual ever settles down to the task of drilling a complete hole, that is, of beginning the job and carrying it through to the end with no interruptions excepting such as may be imposed by the inherent limitations under which the work is done. And the observer is led thus to wonder even though birds are occasionally seen to peek in one spot for some minutes with only momentary cessation.

I should say the performance resembles more that of young children when doing household tasks assigned them by their parents, than the play of such children. Dozens of the little side acts, as they may be called, which the birds do, remind one strongly of the momentary stopping of a small boy when running on a family errand, to pick up a stone and throw it, more or less aimlessly, at a telegraph pole or any other object that may happen to be near.

At this point comes in a question of real interest raised by a cursory observation. That question is, Do the birds really "stop to rest" once in a while in the course of their labors? The observation may be given by a transcription from my notes.

A curious incident this morning: A half-dozen or more birds busy on the job. At about 8:45 one noticed clinging to the under side of a dry limb, quite motionless. Remained in the same spot and position till 9 o'clock with only a slight movement of the head once in a while. During the fifteen minutes not a woodpecker was seen or heard around this tree. Then all, including the one watched, began to squawk, and fly around. Was this a rest period for all the birds in this group?

Of course I was on the look-out for a recurrence of this the next morning. And sure enough, at 9 o'clock, a bird was discovered clinging to the under side of a much arched, dry top of a near-by black oak. And this individual remained quite as motionless as had the one watched on the previous morning, for ten minutes after being discovered. However, there was not so complete a cessation of activity by the other birds as on the morning before. In this instance the quiescent bird was near enough to enable me to see, with my glasses, that its eyes were open and winking—which fact was taken as proof that the bird was not asleep.

On the third morning I saw nothing really suggestive of a rest period. But as my observation had to be made this time in the midst of breaking camp and packing up, I could not see much of what the birds were doing.

When one reflects that work begins early in the morning (by 6 o'clock at latest) and goes on almost incessantly, it seems not unlikely that three hours of it would bring fatigue enough to justify some minutes of complete rest. This question certainly deserves more study than I was able to give it.



Let us now revert to our leading question in order to see how it looks in the light of the facts we have been examining. That question was, you will recall, How nearly perfect is the adaptation of the activities connected with food gathering and storing by the California woodpecker? If the facts are really as presented no one can, I think, fail to see that none of the adaptations are perfect and that some of them are so imperfect that they are apt to result in serious injury or even death to the birds.

So here these "Further Observations" must end. One is terribly tempted to plunge into a flood of inquiry as to what such facts about the lives of woodpeckers may mean for the lives of men. But, of course, when such a plunge would involve pulling with one an entire company of his fellow beings, he must forbear. Forbearance can not, however, restrain me from saying this much as my positively last ending:

The only possible way of correcting imperfections in adaptations of the sort we have been considering, is through what we name intelligence. And this is equivalent to saying that *Nature's way of reducing to a minimum the inefficiency, the wastefulness, and the dangers involved in all living nature is what has been given the name Intelligence.* Such is the central thesis of my psychological philosophy.

*Scripps Institution for Biological Research, La Jolla, California, March 23, 1922.*

## FOSSIL BIRDS FROM THE PLEISTOCENE OF MCKITTRICK, CALIFORNIA

By LOYE MILLER

IT HAS been my good fortune and a great pleasure the past winter, to cooperate with mammalian Palaeontologists in the exploration at McKittrick, California, of a new exposure of Pleistocene asphalt comparable in nature, if not in extent, with the renowned Rancho La Brea beds of Los Angeles. Merriam and Stock (*Science*, n. s., LIV, p. 566, Dec. 9, 1921), have published a brief note upon these beds, enumerating the more characteristic mammal remains that have come to light in a brief reconnaissance. At the invitation of Dr. Stock, under whose direct supervision the work is going on, I spent a brief time with his field party from the Museum of Palaeontology and have undertaken the study of the avian remains excavated. This preliminary note is offered to CONDOR readers because of the live interest they have taken in the work at Rancho La Brea and the right good service that many Cooper Club members have rendered in contributing comparative material. All specimens taken out are deposited in the Museum of Palaeontology of the University of California at Berkeley.

The most casual inspection of the three hundred thirty odd specimens of McKittrick birds now on hand brings out some marked differences between this assemblage and those from other western horizons. To determine the underlying forces that have brought about these differences constitutes the present problem.

Perhaps the most striking feature that was brought out in the study of the Rancho La Brea birds some years ago was the great abundance, both in species and in individuals, of its raptors, many of which were of large size. Three condors, two smaller cathartids, two Old World vultures, a caracara, and the great *Teratornis* made up the contingent of scavenging raptors. Six eagles, three buteonines, three falcons, the marsh hawk, and the white-tailed kite, represented the active predators by day, while a night shift of six species of owls continued the predatory work after sunset. More than half the total bird remains taken from these beds came from birds of the orders of raptorial habit—a most unusual situation indeed.

The collection from McKittrick is admittedly a limited one, yet it is sufficient to show the totally different proportions of its fauna. The golden eagle (*Aquila chrysaetos*) is the only raptor represented by more than one or two specimens, but of this lusty fellow there appear some ninety determinable bones. *Polyborus* (sp.) is the next raptor in point of numbers, with seven bones; the little *Falco sparverius* follows with four; and *Circus hudsonius*, *Falco peregrinus*, *Geranoaetus* (?), *Cathartes* (?), and *Teratornis*, with one specimen each. In contrast with this limited predatory population, the water birds, so scarce at Rancho La Brea, constitute more than two-thirds of the determinable remains thus far taken from the new horizon. Anserines, ranging in size from a teal to a goose, are in the majority, being represented by 33% of the whole collection. Limicolines follow in order with 20%, whereas at Rancho La Brea they number less than one in ten thousand. Two large storks resembling *Ciconia maltha* and *Jabiru mycteria* are present in numbers approaching 15%, while herons and cranes are well represented.

The order of the scratchers has contributed to the collection thus far but a single bone, the coracoid of a quail indistinguishable from the present bird of the region, *Lophortyx californica*. Rancho La Brea, though equally poor in quail remains, is abundantly rich in the big *Parapavo*, as yet undiscovered in the McKittrick. The two localities agree in the total absence of all the gull tribe, as well as in the great scarcity or entire absence of all sorts of diving birds, a matter of considerable interest in view of the abundant ducks and geese.

While the collections from McKittrick are admittedly meager as yet, they are, nevertheless, very strongly indicative of topographic differences that must have existed between the locality and that of Rancho La Brea at the time of entombment of the bird remains. The indicated contrast lies in the different amounts of open water and of cover offered as attractions to them.

At Rancho La Brea, the great abundance of *Parapavo* strongly suggests a considerable amount of timber, at least in spots. There are, to be sure, osteologic differences between this bird and its present-day relatives, sufficient to admit of great diversity of habit, yet *Parapavo* could scarcely have been a bird of the open plains. The presence of bedded leaves, of twigs, and even of goodly sized tree trunks further bears out this impression of cover, while the scarcity of anserines and the almost total absence of limicolines indicate the absence of shallow, open water in bodies of any great size. Water there was to be sure, but it might well have been in very narrow basins or in brushy seepage areas augmented during the rainy season into a slow-moving stream along the bed of a slight depression. Just such conditions, except for the absence of timber, prevail in the im-

mediate neighborhood of Rancho La Brea today. Moderate shift of drainage lines would readily produce, or as readily destroy, such thickets.

At McKittrick, quite a different picture presents itself to the imagination. Mud flats of some appreciable extent are the insistent demand which such a wader population would make upon our powers of reconstruction. These dabblers call for mud in quantity, spread out, free from thicket, and barely exposed above quiet waters. The anserine population makes a somewhat similar demand. To be sure, an occasional duck will drop down into the smallest of pools, but this goodly host of paddlers of all sizes certainly indicates open water somewhere in the near vicinity. Storks, herons, and cranes in force raise the water birds to a two-thirds majority (67%). Surely such a population could have been assembled only by the lure of open country. Conditions during the Pleistocene might well be considered to have been much like those now prevailing at Buena Vista Lake a few miles to the eastward of McKittrick.

The oil seepage which entrapped the birds may well be considered to have been located at or somewhat back from the margin of such a lake. The upheaval and subsequent erosion that resulted in the present location of the asphalt lens upon a hillside could easily have obliterated other evidences of the lake by removal of typical lacustrine deposits.

The other alternative to such a reconstruction, a view supported by the abundant remains of mud-gathering swallows, is that of an oil seepage accompanied by springs of fresh water discharged through vents of common origin with the oil. To such springs, in seasons of increased alkalinity of lake waters, many species of birds might repair for drink. Probably the hypothesis most nearly approximating the truth, however, is of a marginal seepage connected at least by slough or muddy runway with a lagoon of appreciable size.

The chief objection to this lacustrine reconstruction is the previously mentioned fact that remains of gulls and divers are entirely lacking. But may we not find some measure of reason for this discrepancy in the habits of these birds? Would not their habits offer a measure of immunity from the dangers of the oil-seepage that ducks and waders would not enjoy? They are birds of open water or sand bars, rather than dabblers in the mud. Buena Vista Lake is today a notable breeding place for ducks of several species. Their nests are placed in grassy and marshy spots in the vicinity of, yet removed from, open water. Runways to and from such sites might readily lead the birds into danger from oil seepages and deprive them of the immunity accorded to gulls and grebes.

Can we derive profit in comparing the McKittrick fauna with that of other lacustrine deposits such as Fossil Lake, Oregon? At this locality there has been worked out one of the most varied faunas thus far recorded from western America. Shufeldt (*Journ. Acad. Nat. Sci. Phila.*, ser. 2, no. 9, 1892, p. 389) catalogued fifty or more of its species in 1892 and several have been added since that time. This interesting fauna includes the following groups: Order Pygopodes, 8 species; Longipennes, 9; Steganopodes, 2; Anseres, 30; Odontoglossae, 1; Herodiones, 3; Paludicolae, 2; Limicolae, 1; Gallinae, 5; Accipitres, 3; Striges, 1; Passeres, 2.

This list is notably lacking in storks, in cranes, and in scavengers, while herons and shore birds are but sparingly present. On the other hand, it is rich in divers, in gulls, and in ducks. The several students who have studied the assemblage of species agree that an open, shallow, and possibly ephemeral lake

constituted the Pleistocene environment that attracted them. Whether subject to complete periodic obliteration or not, it probably did fluctuate greatly in extent within its shallow basin. The fossil remains are found sparsely distributed over a wide area and preserved in the silt-like accumulation at the bottom of the ancient lake. There is no evidence of concentration at one point such as appears at both the asphalt horizons. It hardly seems credible that waders were lacking at Fossil Lake or that gulls and divers shunned the neighborhood of McKittrick during Pleistocene time. The difference between the two avifaunas is more probably due to difference in method of entombment rather than to diversity of physiographic or of climatic environment. Probably the birds actually present during the Pleistocene were much the same in the two localities, although it is likely that there was more marsh and slough country in the neighborhood of McKitt-rick.

On the other hand, the differences between the McKittrick and the Rancho La Brea collections are due probably to an actual difference in fauna due to diversity of the immediate environments of two localities in which the method of entombment was the same.

Regarding the particular part of the Pleistocene to which the McKittrick assemblage belongs, it is too early yet to comment at any length. The writer has already pointed out (Univ. Calif. Publ., Bull. Dept. Geol., vol. 7, no. 5, 1912, p. 105) the inaccuracy of avian remains as indices to the relative age of two faunas where one of them includes a much larger proportion of migratory species than does the other. Just such diversity of habit sets off the McKittrick assemblage from that of Rancho La Brea. This fact coupled with the poverty of material thus far excavated from the former beds makes comment upon their relative ages at present inadvisable. Both seem, however, to have been accumulated during a time when the climate was warmer than at present, though whether or not during the same Pleistocene amelioration can not be stated.

*Los Angeles, California, May 15, 1922.*

## A NEW SPARROW FROM SOUTHERN CALIFORNIA

By W. E. CLYDE TODD

A FEW years ago, in overhauling the birds of the genus *Aimophila* in the collection of the Carnegie Museum, I discovered that certain specimens of *A. ruficeps* from southern California were appreciably different from others coming from the region of San Francisco Bay (Nicasio, Marin County). The latter agree among themselves, and with a good series from various other localities in the state, from Sutter County on the north to Los Angeles County on the south, which I have examined in this connection. *Ammodromus ruficeps* of Cassin, described in the Proceedings of the Academy of Natural Sciences of Philadelphia (vi, 1852, p. 184) came from the Calaveras River, near Stockton, California, as we learn from the A. O. U. Check-List of North American Birds (ed. 3, 1910, p. 272). This series from central California agree well with the figure in Cassin's Illustrations of the Birds of California (1854, pl. 20); but in order to make sure of the correct application of the name I forwarded examples of both forms to Dr. Witmer Stone with a request to compare them with the type-specimen in the Philadelphia Academy. He writes as follows (February 15, 1917): "The type of '*Ammodromus*' *ruficeps* is like the Nicasio specimen, i. e., buffy instead of grayish below." It therefore remains to provide the southern California race with a name, and I propose to call it

***Aimophila ruficeps canescens*, subsp. nov.**

*Subspecific characters*.—Similar to *Aimophila ruficeps ruficeps* (Cassin), but wing and tail longer and under parts less buffy, more grayish in tone. Similar also to *Aimophila ruficeps sororia* Ridgway, but darker above, and darker, more grayish, below.

*Type*, no. 14,586, collection Carnegie Museum, adult male: San Diego, California; January 23, 1894; A. W. Anthony.

## MEASUREMENTS

*Aimophila ruficeps ruficeps*:

No.	Locality	Wing	Tail	Bill	Tarsus
14589 <sup>1</sup> ♂	Nicasio, Calif.	58	60	10	19
44518 <sup>2</sup> ♂	Nicasio, Calif.	53	58	11.5	19.5
15422 <sup>3</sup> ♂	Berrvessa, Calif.	60	65	10.5	21
27323 <sup>4</sup> ♂	Dun'low, Calif.	61	67	12	21
26285 <sup>4</sup> ♂	Varain, Calif.	59	64	10.5	19.5
29037 <sup>4</sup> ♂	Claremont Creek, Calif.	58	61	12	20.5
Eleven males, <i>fide</i> Ridgway		59	63.5	11.5	20

*Aimophila ruficeps canescens*:

14585 <sup>1</sup> ♂	San Diego, Calif.	64	70	11	20
14586 <sup>1</sup> ♂	San Diego, Calif.	64	68	11	19.5
14587 <sup>1</sup> ♂	San Diego, Calif.	67	67	12	19

*Aimophila ruficeps sororia*:

71335 <sup>1</sup> ♂	Sierra de Laguna, L. Calif.	60	63	12	21.5
15941 <sup>2</sup> ♂	Triunfo, L. Calif.	63	68	12	20.5
15945 <sup>2</sup> ♂	Triunfo, L. Calif.	60	60	12	20.5
15946 <sup>2</sup> ♂	Triunfo, L. Calif.	62	63	12	20.5
47922 <sup>5</sup> ♂	El Lanz, L. Calif.	63	64	12.5	21

<sup>1</sup>Collection Carnegie Mus.<sup>2</sup>Collection William Brewster.<sup>3</sup>Collection U. S. National Mus.<sup>4</sup>Collection Univ. Calif. Mus. Vert. Zool.<sup>5</sup>Collection Mus. Comparative Zool.

*Remarks.*—Specimens from northern Lower California resemble those from San Diego, and clearly belong to the same form, but as they are more or less worn they are not included in the table of measurements. These specimens are the same ones referred to by Mr. Anthony (Zoe, iv, 1893, 242) as being “practically indistinguishable from southern California examples”, but he seems not to have suspected that the latter were not true *ruficeps*. *A. ruficeps canescens* is really intermediate in its characters between *A. ruficeps ruficeps* and *A. ruficeps sororia*, but is grayer than either, and is evidently as well entitled to recognition as certain other races of birds found in this general region. It doubtless grades into the former in Los Angeles County, California, as indicated by a specimen from Pasadena (Mus. Vert. Zool., no. 35813), but where it meets the range of *A. r. sororia* is an undetermined question.

*Specimens examined.*—California: San Diego, 3. Lower California: Guadalupe Valley, 1; Sansal del Comanche, 3; Piñon, 1; Todos Santos Island, 2. Total, 10.

My acknowledgments are due to the authorities of the several institutions already specified for the loan of material for comparison, and to Dr. Harry C. Oberholser for his advice.

*Carnegie Museum, Pittsburgh, Pennsylvania, May 11, 1922.*

## STATUS OF THE CRESTED JAYS ON THE NORTHWESTERN COAST OF CALIFORNIA

By JOSEPH MAILLIARD

WITH MAP

SINCE the year 1908, when it was found that the crested jay of that part of the Humid Coast Belt lying in Sonoma County, California, was not distinguishable from the Blue-fronted Jay (*Cyanocitta stelleri frontalis*) of the interior mountains and the southern portions of California, the idea of intergradation on the northwest coast of this state between the Steller Jay (*Cyanocitta stelleri stelleri*), of the southern Alaskan and British Columbian coasts, and the Coast Jay (*Cyanocitta stelleri carbonacea*), of the central humid coast belt, has, in my judgment, been open to doubt. It hardly seemed reasonable that there should be such an intergrading toward the north when the Coast Jay is not only cut off abruptly in the central humid coast belt by a strip of non-coniferous association, unattractive to this genus, in northern Marin and southern Sonoma counties, but its distribution also is interrupted by the appearance of the Blue-fronted Jay on the opposite side of this non-coniferous barrier.

In 1902, Dr. Walter K. Fisher published an article upon the status of *Cyanocitta stelleri carbonacea* (Condor, iv, pp. 41-44), in which he gives the distinguishing characteristics of the different members of the genus *Cyanocitta* on the Pacific Coast, illustrated by a map showing their distribution as understood by him at that time. This paper was written not long after the Coast Jay was described by Grinnell (Condor, ii, 1900, p. 127), when much less was known of

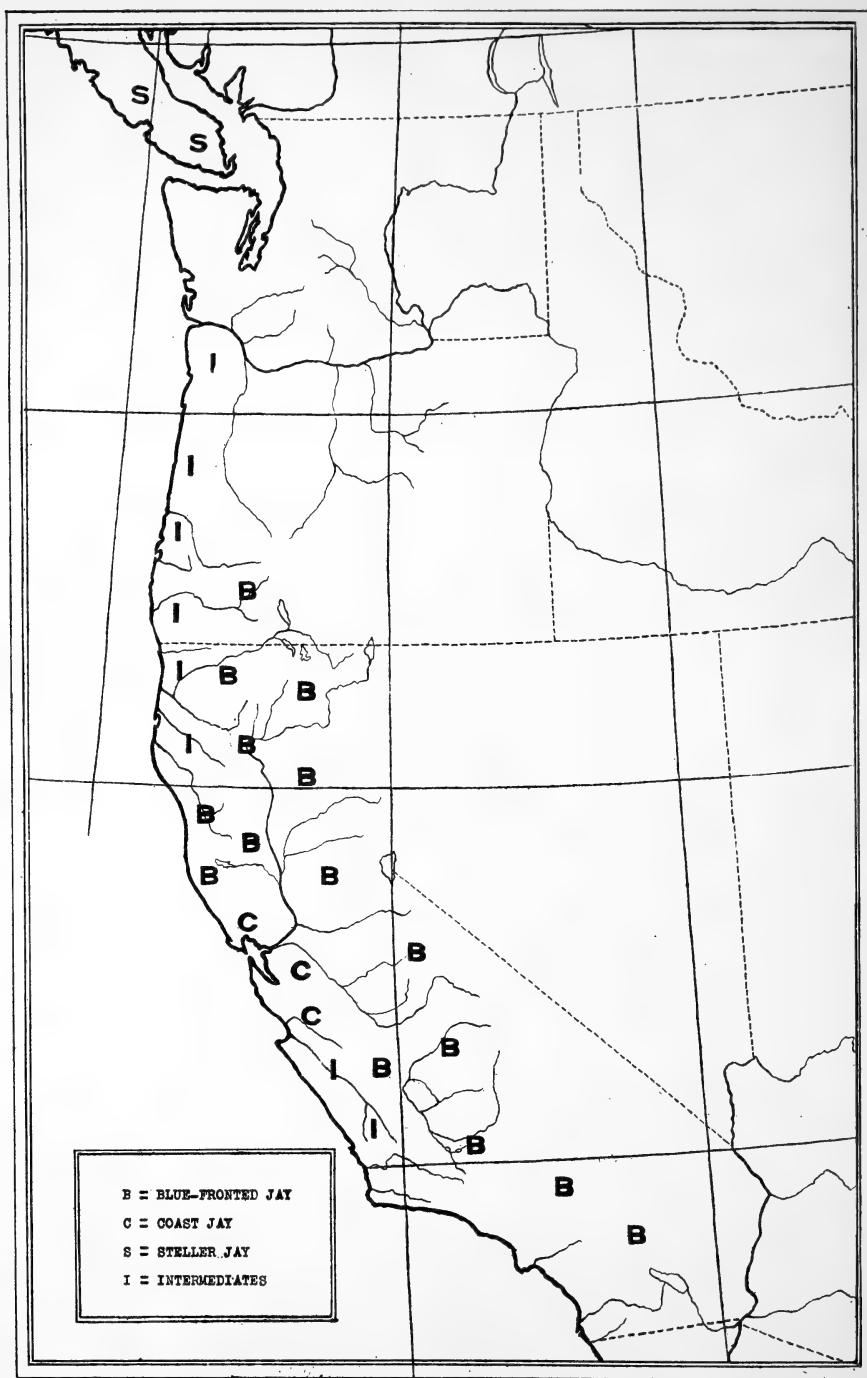


Fig. 33. MAP SHOWING DISTRIBUTION OF THE DIFFERENT RACES OF CRESTED JAYS ALONG THE COAST LINE FROM VANCOUVER ISLAND SOUTH TO EXTREME SOUTHERN CALIFORNIA.



these races than at present, and when there was a comparatively limited number of specimens at Dr. Fisher's disposal.

From his conclusions I infer that insufficient attention was given to the matter of using strictly comparable stages of plumage, or to the consideration of the dates of capture of specimens examined and the various degrees of fading of colors shown at different seasons of the year. It is obviously unfair to compare specimens from one locality, of one season, with those from a different locality of another season of the year. There is too much seasonal change in such cases to allow of fair comparison, and I think that some of the errors that have been handed down have come about through failure to emphasize this principle. Dr. Grinnell (Auk, xix, 1902, p. 128) remarks in this connection, that "a series of *Cyanocitta stelleri* from the cloudy, humid Sitkan District taken in June and July show but slight traces of wear; while specimens of *Cyanocitta stelleri frontalis* from the arid Sierra Madre Mountains of southern California taken at the same season are so ragged and faded as to almost completely destroy the fresh fall coloration".

Examination of a large number of specimens, some of them many years old, taken at different seasons of the year, shows that fading, induced by exposure in the case of live birds (or by age in the case of even many well-kept skins) reduces the proportion of black and increases the amount of brown on the heads and backs of the three races considered in this paper. Some fading takes place in *stelleri*, but the mantle remains very dark, with less brown showing than in *carbonacea*. In the case of *carbonacea* the brown is very evident even in fresh plumage and becomes more pronounced as the seasonal changes progress, ending with a rich or warm brown by the beginning of the summer molt.

The first of these races is the darkest all over, with the mantle a very dark brown, or "warm slate black" as some authorities have it. The second is a lighter colored bird, with the mantle much more brownish, or a "warm slate gray"; while *frontalis* is much lighter yet, and has the mantle of a dark mouse gray which, in fresh autumn plumage, shows very little trace of brown. In this last race the head and crest are of a bluish black that contrasts quite strongly with the mouse gray of the back, the contrast being much greater here than in either of the other two races. One of the distinguishing characteristics of *frontalis* is this bluish wash that pervades not only the black of the head, but all of the darker parts.

On specimens taken at Requa, Del Norte County, California, in fresh plumage (September) there is a barely perceptible tinge of brownish to the dark bluish slate, or mouse gray, of the mantle, or to the (almost) black of the head and crest; whereas on specimens from the same locality taken in May, the tinge of brownish, while still slight, is very easily discernible, but it is not the same brown as that of *carbonacea*. It is a much lighter brown, and towards fall the old worn feathers become a grayish brown.

As compared with birds from Requa, autumn specimens taken progressively farther south along the coast show a lighter slate on the back and less depth in the black of the head, but the bluish wash is distinctly present. The gray on the throats of these northwest coast birds is lighter and the area covered by it is much more extended than it is in *carbonacea*, it being very similar in these particulars to that of *frontalis*.

The blue of the underparts of all the races of *Cyanocitta* varies a great deal with individuals. Some of the Requa birds tend strongly toward the blue of *frontalis* while others are of darker hue, but, even with these of darkest blue, the rump is lighter than that of *stelleri* or even of *carbonacea*. In these northwest coast specimens secured by us, the blue frontal spots are very conspicuous in nearly all of the adult birds, very much like the "blue fronts" of *frontalis*, and on the average much more conspicuous and extended than they are with *carbonacea*. This character is much restricted in *stelleri*.

One of the difficulties in making the differences in coloration clear to the reader is due to the variety of definitions given by different authors to the colors of the parts of the various subspecies of this jay. For instance, in four of our leading publications which are recent enough to consult for the purpose, the color of the back and scapular region in the case of the Steller Jay is given as follows: "deep black, or brownish black", "dark sooty brown", "fore parts of body dull blackish", and "sooty brown"; while Dr. Fisher, in the CONDOR article already quoted, calls it "warm slate black". This last description is to my mind the most suitable, if Ridgway's Nomenclature of Colors is used as the basis of comparison. Again, the second and third of the above authorities, in the same order, give these parts of the Coast Jay as, "slaty brown or brownish slate", and "back warm slate gray"; while Fisher gives the color as "warm slate gray", with which I do not so readily agree. In the case of the Blue-fronted Jay the colors run as follows: "brownish slaty", "hair brown, broccoli brown or drab", "fore parts of body brownish slate", and "similar to No. 487 (*stelleri*) but back paler"; while Fisher calls it "mouse gray", which seems to me to be correct.

Dr. Fisher made a trip to the northwest coast of this state in 1899, and, in a paper published soon after, stated that the jay of the Humboldt Bay region was typical *carbonacea*, both in summer and winter (Condor, 1902, p. 133). Now, if Dr. Fisher was correct in this diagnosis, at what point on the coast, between the Blue-fronted Jay habitat in Sonoma County, and Humboldt Bay, did the latter form give way again to the Coast Jay? Between the mouth of the Russian River, in Sonoma County, now known to be inhabited by the Blue-fronted Jay, and Humboldt Bay, there are no non-coniferous areas of any size, none large enough to make a barrier against this genus. The character of all this coast stretch—the nature of the association, and the climate—is practically the same throughout, differing only in degree. This being the case, where and why would the Blue-fronted Jay, which inhabits a cross-section of the state in all suitable localities, straight east from the mouth of the Russian River to the Sierras, merge into the Coast Jay to the northward? Or, why should the Coast Jay interpolate itself into the realm of the Blue-fronted in such a leap-frog fashion.

Opportunity presented itself for a visit to Eureka in June, 1916, and during my stay there several specimens of the jay were obtained from the Humboldt Bay region. The plumage of the birds taken at that season of the year was poor for comparisons, but I remarked at the time upon the light coloration of these specimens as compared with Coast Jays from the central coast district (Condor, xviii, 1916, p. 199), and called attention to a certain similarity between them and specimens from Sonoma County, which latter have since been acknowledged to be good *frontalis*. However, not enough evidence had yet been brought to bear upon the points involved, and but little interest in the matter had so far been

aroused for the reason that no one else questioned the dictum of the authorities, who had stated that the Coast Jay occupied the Humid Coast Belt in California from the Santa Lucia Mountains, in southern Monterey County, north to the Oregon line.

As no further light upon this subject seemed to be forthcoming, and as this sort of work could be combined with other interests in the same line, it was decided to map out the field work of the Department of Ornithology of the California Academy of Sciences for the year 1921 so as to cover this northwest coast region and decide the matter definitely. This field party comprised two members, Mr. Chase Littlejohn, assistant curator, and myself for the spring work, with Mr. Chester C. Lamb temporarily taking Mr. Littlejohn's place for the fall work.

Breeding specimens of the crested jay were obtained at Patrick's Hotel and at Requa, Del Norte County, the former place being situated in the mountains about twenty or twenty-five miles in a straight line from the ocean, and the latter at the mouth of the Klamath River, practically on the ocean; while a few were also secured at Myer's Ranch, Humboldt County, probably eighteen miles inland, during the spring work. Every one of the specimens so obtained showed a closer approach to the Blue-fronted than to the Coast Jay! Yet it was difficult to say what dates of capture of the spring birds of the northwest coast would correspond with those of specimens from the central coast region so that the comparison might be a just one, since the northern season is so much colder and later than that of the central area.

To overcome this element of doubt, the fall trip was made over practically the same ground, but specimens were collected in more places, these being from north to south as follows: Requa, Del Norte County; Kneeland Prairie (16 miles in bee line east of Humboldt Bay), Petrolia (5 or 6 miles from the ocean), Thorn (same distance inland), all in Humboldt County; and Cummings (over 20 miles inland), Mendocino County.

The birds from all these places are in fresh new plumage, in the best possible state for comparison with birds in similar plumage elsewhere. The spring birds, taken in the third week in May, from Patrick's Creek, are practically *frontalis*, somewhat darker than typical specimens of this race, but as near typical as are many other specimens that are unquestionably placed with *frontalis*. Patrick's Creek is a tributary of Smith River, and the coniferous forest covering the canyons of these streams is thus directly connected with that of the sea-coast, with no break of any magnitude in the way of country unsuited to this jay.

In April and May a good series of jays was obtained at Requa, and they proved to be darker than any taken south of that point; but the decidedly brownish tinge of the crest, head, neck and back of the Coast Jay is not noticeable in those parts of the spring birds from Requa when compared with the former. In these latter birds there seems to be a slight brownish cast when they are looked at by themselves, but this disappears on comparison with *carbonacea*, when the resulting contrast makes the head of the Requa birds look black, or slaty black. The crest feathers of the Requa birds seem to match the Black or Slate Black of Ridgway's Nomenclature of Colors more nearly than they do any of the other combinations or hues.

The back of the northwest coast jays appears to be nearer to the Dark

Mouse Gray of Ridgway's Nomenclature of Colors than to anything else, thus according with Dr. Fisher's description of the back of *frontalis*, in which he states positively that the back is "mouse gray", while he gives the back of *carbonacea* as "warm slate gray". In these northwest coast jays there is the distinct blue wash over the darker parts, when viewed in the right light, and in none of these does the dark mantle extend as far posteriorly as it does in *carbonacea* and *stelleri*, but shades more rapidly into the blue of the lower back and rump, as is the case with typical *frontalis*. What slight brownish tinge there may be on some specimens of these coast birds is mostly confined to the scapular region. The blue of the lower parts of the Requa birds is decidedly darker than that of any of the specimens secured farther south, that is to say, farther south than Humboldt Bay, and below. We did not have an opportunity to secure any jays between Requa and Humboldt Bay. These should show some gradation in regard to this darker coloration.

The jays taken in the end of September and beginning of October at Kneeland, Petrolia, and Thorn, were all of a rather lighter shade than those from Requa, but were all of the same general tone of coloration. Placing one of these alongside a bird of corresponding date from the San Francisco Bay region brought out the difference in a most convincing manner. A friend, whose artistic line of business calls for a keen appreciation of colors, was asked to examine the different jays here concerned and to give an unbiased opinion as to the correctness of my diagnosis of their color schemes. With absolutely no knowledge of birds, this friend without hesitation picked out the northwest coast birds from those of the central coast and placed them with the *frontalis*, as being most closely allied to that form, and secondarily with *stelleri*. This was done, of course, without looking at the labels, and was a strong confirmation of my diagnosis.

Recently I had the pleasure of going over with Dr. Fisher, the series of seventy-eight specimens of *Cyanocitta* secured during the Academy field work along the northwestern California coast in 1921, and directing his attention to the points I am endeavoring to bring out in this paper. He was greatly interested in the matter, and finally decided that he had not had sufficient material, nor a sufficiently extended knowledge of conditions pertaining to the subject at the time of writing his paper already referred to, upon the status of these jays, to do the subject full justice.

#### CONCLUSIONS

As a result of our work in the field, and of the examination of a large number of specimens (from the Museum of Vertebrate Zoology, University of California, from the Mailliard collection, and from that of the California Academy of Sciences), I have arrived at the conclusion that the crested jay along the northwest coast of California commences with the nearly typical Blue-fronted Jay (*Cyanocitta stelleri frontalis*) in the vicinity of Freestone, Sonoma County, just north of the open non-coniferous country that extends east from Tomales Bay to the Napa Valley; that toward the north along the coast these birds grow gradually darker, the darkest California specimens being found in the county of Del Norte in the northwest corner of the state; that this darkness increases northward along the Oregon and Washington coasts until merged into typical *stelleri*; that toward the interior of California, corresponding to the decrease of humidity

and increase of light, the northwest coast birds gradually revert to *frontalis* proper; and that most of the intermediates from the northern interior of this state are intermediate with *stelleri* and not with *carbonacea*. In northern Oregon and in Washington they are probably intermediate with *annectens*.

A specimen from central Oregon, taken at Bend, on the Deschutes River, by Alexander Walker, is recorded in the Condor, xix, 1917, p. 137, as having been identified by Dr. H. C. Oberholser as *carbonacea*. This diagnosis does not fit in with this idea just set forth, but I have not seen the specimen in question and can not give any opinion upon it other than to suggest that it may be one of those indefinite individuals that are sometimes met with and which are very difficult to place.

While there appears to be some slight gradation between the Coast Jay, from south of the open stretch each of Tomales Bay to Napa Valley, with the Blue-fronted Jay, found just north of that region, such intermediates seem to be rather rare, less than half a dozen of the specimens examined showing indication of it. This open country is only some twenty miles across, but it seems to make a very effective barrier against the intermingling of these two races. In fact the above examples of supposed intergradation may be only cases of individual variation.

Toward the southern end of the habitat of the Coast Jay in Monterey County, however, we know that there is extensive intergradation, as proved by many specimens examined, with a gradual merging into the Blue-fronted Jay toward the interior and farther south.

Many geologists believe that at one time in the geological history of this coast an insular condition existed in that portion of it extending from Mt. Tamalpais, just north of San Francisco Bay, as far south as Monterey Bay, and that this territory was shut off by water from the interior. From Tomales Bay north, however, there seems to be no evidence of similar conditions having prevailed in any of that part of the coast of California.

*Cyanocitta stelleri carbonacea* now occupies the portion of the central California coast that was supposed at one time to be either an island, or a group of islands not widely separated. If this were the case, why not suppose that the genus *Cyanocitta* originally occupied the interior mountains of the state and spread toward the coast from there? Then, when the central coast subsided so as to bring about an insular condition, why not assume the hypothesis that this subsidence was of sufficiently long duration to evolve the race of *carbonacea* to suit the prevailing conditions; or, in other words, why may not *carbonacea* have been at one time an insular form?

*California Academy of Sciences, San Francisco, April 3, 1922.*

## FROM FIELD AND STUDY

**The Arizona Crested Flycatcher as a Bird of California.**—On May 17, 1921, Mrs. May Canfield collected two Arizona Crested Flycatchers (*Myiarchus magister magister*) in the bottomlands of the Colorado River, near Bard, Imperial County, California. These specimens which are now numbered J 1071 and J 1072 in my collection, are of particular interest, since they constitute the first record of the appearance and capture of this species in California.

In connection with this record, it is of interest to note that the birds were collected in an indigenous willow-cottonwood association bordering cultivated fields. Too much stress must not be placed, however, upon the difference between this environment and the giant cactus association in which Mr. H. S. Swarth (Pacific Coast Avifauna, no. 10, 1914, pp. 40-41) found these birds nesting in southeastern Arizona, and to which he considered the species restricted, at least in that section. The date of the present capture is a dangerous one to conjure with when the breeding or migrational status of a species is in question. There are isolated groves of this same sahuaro cactus (*Cereus giganteus*) only a few miles distant from our California record station. In the migration of many species, the males precede the females. The collection of two males, instead of a mated pair, may therefore well suggest the probability that these birds were simply on the move to nesting sites in the sahuaros, a bit farther to the north.

From Mr. Swarth's experience, and from our own, it is perhaps permissible to predict that the range of this species will ultimately prove to be delimited in California by the northern and western outposts of this cactus within our borders. The foothold of the sahuaro in California is admittedly precarious. If the summer range of *magister* should be found to be coincident with the distribution of this cactus, and if the latter should be extirpated by the agency of man, or otherwise, it would be interesting to note, as the years go by, whether the flycatcher in question has sufficient associational plasticity to adapt itself to the changed ecological condition, or whether it would retreat, in that event, to the sahuaros of Arizona.—DONALD R. DICKEY, *Pasadena, California, April 25, 1922.*

**Occurrence of the Surf Scoter on Fresh Water.**—A neighbor shot five Surf Scoters (*Oidemia perspicillata*) April 5, 1922, on a small pond at the head of his irrigating ditch at the lower end of La Puerta Valley, San Diego County, California; altitude 2100 feet. One was a male, the other four females. The male was given me and I preserved the skin (now no. 43202, Mus. Vert. Zool.). I think this is the first fresh-water record for this species for California.—FRANK STEPHENS, *San Diego, California, April 10, 1922.*

**The Salt Marsh Yellowthroat in Southern California.**—Some months ago, when Mr. Donald R. Dickey and the writer had occasion to work over a series of Yellowthroats (*Geothlypis trichas*) taken in the salt marsh area about Anaheim Bay, Orange County, California, it was found that two forms were present. Most of the birds were readily referable to the fresh water resident, *scirpicola*, but nine dark, small specimens seemed to belong to the San Francisco Bay race, *sinuosa*. Three of the latter were sent to Mr. H. S. Swarth, of the Museum of Vertebrate Zoology, who pronounced them representative of that form. He also suggested that breeding yellowthroats from the southern California salt marshes be collected in order to determine their exact status.

Accordingly, on April 21, 1922, I took, at Hog Island, Anaheim Bay, Orange County, three males in breeding condition, and a female carrying nesting material. These are found to be not quite typical of, but may be safely called, *scirpicola*. The extreme dates for the occurrence of *sinuosa* in this region are October 3 to March 15, so that it evidently occurs as a spring and fall migrant as well as a winter visitant. Under the circumstances, the appearance of *sinuosa* in the salt marshes of southern California indicates that this form is, to a degree at least, migratory, and not the hard and fast "resident" of the San Francisco Bay region, which it was previously supposed to be.—A. J. VAN ROSSEM, *Los Angeles, California, May 23, 1922.*

**A Second Capture of the Broad-tailed Hummingbird in California.**—One of the interesting results of field work carried on by Mr. Laurence M. Huey in the White Mountains during the past summer and fall was the taking of an immature male Broad-tailed Hummingbird (*Selasphorus platycercus*) in fresh post-juvenal plumage. This specimen was collected at an altitude of 9000 feet, on Cottonwood Creek, White Mountains, Mono County, California, August 23, 1921, and is now number J 1590 of my collection.

As early as May, 1912, Mr. H. S. Swarth, while engaged in field work in the Inyo Mountains for the Museum of Vertebrate Zoology, detected the presence of this species within the confines of our State, and later recorded his experience (Condor, xviii, 1916, p. 130). His sight record and the accompanying prognostication were later confirmed by the taking of a female and two young in the White Mountains by another field party of the same Museum. In commenting on the taking of these first actual specimens in California, Dr. Joseph Grinnell (Condor, xx, 1918, p. 87) states that "the indications are that this Rocky Mountain species of hummingbird occurs regularly as a summer visitant to the high mountains along the eastern border of California, east of Owens Valley". The second capture, presented herewith, is merely additional proof that the earlier suppositions were amply justified, and that *Selasphorus platycercus* does occur regularly, if rarely, in the desert ranges of east-central California.—DONALD R. DICKEY, Pasadena, California, April 25, 1922.

**An Unknown Near San Diego.**—For the previous two winters a Green-tailed Towhee (*Oreospiza chlorura*) had frequented our back yard and fed from the bird-table there. This past winter I had been on the look-out for it to appear again. The first week in February I had several times caught a glimpse of a bird with some green on it flying away. I expected to recognize the towhee when I could get a good view of it.

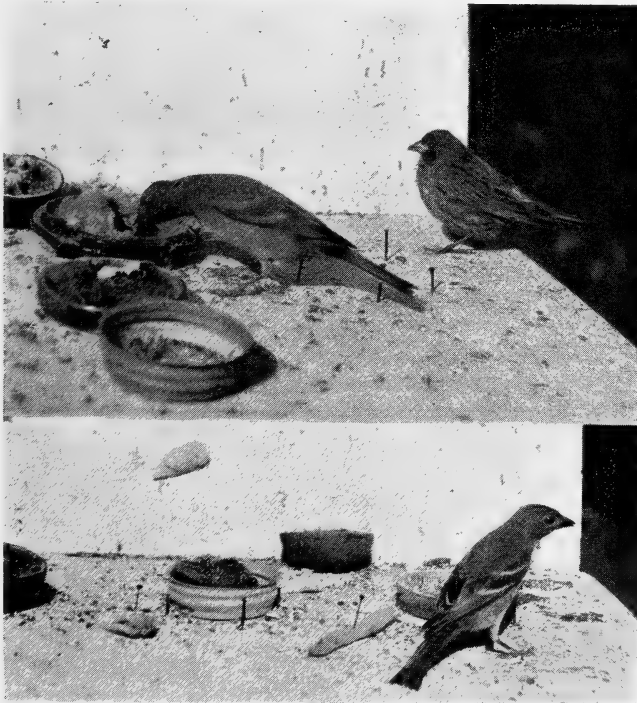


Fig. 34. TWO VIEWS OF AN UNKNOWN BIRD WHICH VISITED A FEEDING-TABLE NEAR SAN DIEGO, CALIFORNIA, IN FEBRUARY, MARCH AND APRIL, 1922. THE LINNET ALSO SHOWN FURNISHES A STANDARD OF COMPARISON.



This opportunity occurred on February 12, but instead of being a towhee it was a very different bird. Its general appearance was very like that of the female Arizona Hooded Oriole, a trifle smaller and more stockily built.

The shapes of the head and bill were quite different from those of the oriole. The bill was an orange yellow, rather brighter than that of the white-crowned sparrow. In size the bill was between that of the grosbeak and that of the oriole. The lower photograph (fig. 34) shows the shape admirably. The eye was prominent and bead-like. The upper parts of the bird were greenish, brightest on the head and rump, back washed with grayish, wings and tail brownish. The under parts were more or less yellow, brightest on throat and rump, whitish in middle. It had two white wing-bars, and later the tertials were slightly tipped with white.

It came regularly to the feeding table from one to a dozen times a day, from February 12 to April 10. Have not seen it since April 10. During those two months there were not more than three days in which I did not see it. It may have come without having been seen.

The table was ten or twelve feet from my window. Each morning I put a small quantity of bird-seed, some cracker crumbs, either a spoonful of canned fruit or a cut orange, and occasionally some suet on the table. I never saw this bird touch anything but the fruit; and it seemed to prefer the canned figs to any other fruit. It ate of the fruit voraciously, coming every half-hour or so as long the daily ration lasted. I did not hear it make a sound until a short time before it left and that was a very odd sound of several syllables that I cannot describe.

The bird was rather shy, especially when the camera was set up near the table, or when I used an opera glass at the window. At other times it did not much mind being looked at. There was no red in the plumage and no yellow on the wings. Its bill was much lighter in color than are the bills of the tanagers in the museum. If it had been two months later I should have called it a Western Tanager without question.

My record of the visits of the Western Tanager (*Piranga ludoviciana*) is as follows: 1908—May 11 to May 15; 1912—April 23 to May 8; 1918—May 4; 1921—May 6 to May 29; 1922—May 12.

If not a Western Tanager what was my unknown bird?—MRS. T. F. JOHNSON, *National City, California, May 29, 1922.*

**Swamp Sparrow Recorded from California.**—On their return from a collecting trip in the White Mountains of California this past fall, Mrs. May Canfield and Laurence M. Huey stopped at various stations to collect series of the local mammals and birds of east-central California. While camped near Keeler, Inyo County, California, on November 1, 1921, a strange sparrow came to a little spring near the camp. The bird was collected and proved to be a Swamp Sparrow (*Melospiza georgiana*). This specimen is number J 1797 of my collection, and constitutes another addition to the California list.

In commenting on the specimen, Dr. Joseph Grinnell calls my attention to its agreement in wing length with middle-western birds, from Illinois, rather than with Atlantic slope representatives of the species, as a rough indication of the source of this straggler.

The bird has been recognized as a regular summer resident west as far as west-central Alberta (A. O. U. Check-List, 3d. ed., 1910, p. 276), but a distinct south-eastern trend of fall migration has been indicated, due no doubt to the barrier of the Rocky Mountains. That the bird occasionally straggles over these mountains far to the south and west is shown both by Howell's Arizona specimen (Condor, XVIII, 1916, p. 213) and by the present California record.—DONALD R. DICKEY, *Pasadena, California, May 4, 1922.*

**Nesting of the California Evening Grosbeak.**—On June 14, 1914, W. W. Moore and myself found a California Evening Grosbeak (*Hesperiphona vespertina californica*). Just out of the town limits of Eureka, in a patch of green timber bordered on the lower end by a salt marsh, we were attracted by the loud whistling and scolding notes of the bird. When we were able to locate the noise, we found four birds feeding in the top branches of a white fir. The light being right we could easily distinguish the two males

from the two females. The noisy bird proved to be a male and seemed to have a quarrel with one of the females. He would stop all his racket and go to feeding; suddenly he would start scolding, drive the female from her feeding place, stop scolding and go to feeding there himself. We saw him do this several times before we left to see what was in a nest of a Black-headed Grosbeak nearby.

From there we went in search of a Western Winter Wren's nest, without success. All of this time we could hear that noisy male Evening Grosbeak at intervals. So back we went, to where the grosbeaks were feeding. We were back several minutes before the quiet male and female flew to another part of the timber. This seemed to set the noisy male agoing; he drove the female across several trees before she disappeared in a thick cluster of small branches near the top of a white fir. The male landed about twenty feet lower down, in the same tree, and all his racket stopped. In a short while he flew in the direction taken by the other pair, and was not followed by the female.

Up the tree I went and was within twenty feet from where the female disappeared when Moore called, "there she goes", and down she came to meet me. Up to the cluster of branches I went; there was the nest, placed in a crotch formed by two branches crossing, and was within reaching distance. The nest was made of dry twigs, that looked as if they were broken by the birds from a near-by dead fir. It was thickly lined with fine dry roots.

The nest contained four eggs, incubation from just right to nearly hatching. The eggs look like Red-winged Blackbirds', and the extremes measured in inches .50 to .64 by .87 to .98. All the time I was at the nest, the female made all the racket the male had previously made, besides snapping her beak. Her scolding must have been heard for quite a distance, but the male did not return.—JOHN M. DAVIS, *Eureka, California, March 30, 1922.*

**The Gray Flycatcher in the White Mountains of California.**—The appearance of the Gray Flycatcher (*Empidonax griseus*) in southern California in migration and in winter, and its disappearance during the breeding season, has for many years been a problem for which there seemed no logical solution. Until recently, there has been no basis of data which would serve to trace its movements in California, after it passes through the San Diegan district as a common spring migrant. However, the recently published records by Oberholser, of the summer occurrence of *griseus* in Nevada (Auk, xxxvii, 1920, p. 133), and in eastern Oregon (Condor, xxii, 1920, p. 37), coupled with the specimens recorded below, seem to shed a little light on the subject. There are, in the Dickey collection, four specimens of this flycatcher, taken by Laurence M. Huey and Mrs. May Canfield, in the White Mountains of east-central California. Three of these are nearly full grown juveniles, two of which were taken at McCloud Camp, Mono County, at an altitude of 10,000 feet, August 27, and the third on Wyman Creek, Inyo County, at 8000 feet, September 4. The fourth is also a juvenile, just coming into first fall plumage, and was collected on Wyman Creek, at 8000 feet, on September 3, 1921. The inference is that these birds were hatched somewhere in the vicinity, for scarcely-grown juveniles would hardly have undertaken any extensive wandering.

It would therefore seem that the Gray Flycatcher, after leaving the San Diegan district, passes north-eastward to the desert ranges to breed. The fact that this region has been but sparingly worked by collectors, accounts, in our belief, for the present scarcity of summer records. These remarks have, of course, nothing to do with the individuals of this species which breed in Lower California, but they do apparently solve the seeming vagaries of movement in the California population of *griseus*.—D. R. DICKEY and A. J. VAN ROSSEM, *Pasadena, California, May 30, 1922.*

**A Third Record of the Gray-headed Junco in California.**—The first records of an unexpected bird in any arbitrary geographic area are necessarily so casual in their very nature as to suggest the advisability of publishing further confirmatory notes. Dr. Joseph Grinnell (Pasadena Acad. Sci., Pub. 2, 1898, p. 38), and Mr. Austin Paul Smith (Condor, ix, 1907, p. 199) have already called attention to the occasional presence of *Junco caniceps* in California. Recent experience leads the writer to believe that this species is a more regular winter visitant to California than the previous records suggest.

During the past winter and spring, Mr. A. J. van Rossem had occasion to make several week-end trips to Oak Glen, situated at the head of the Yucaipa Valley, at an altitude of 5200 feet, in the San Bernardino Mountains, California. Careful scrutiny of the flocks of juncos which frequented the vicinity disclosed two individuals of the Rocky Mountain species, *Junco caniceps*. These specimens (nos. K 75 and K 76, coll. D. R. D.) were collected by van Rossem on March 4, 1922, and thus confirm the field determination.

The heavy rains which the West enjoyed during the winter months of 1921-1922, with the consequent heavy snowfall in the higher altitudes, naturally restricted the winter range of these ground-feeding birds which are, in all probability, normally present in the mountains of southern California during the winter months. It is the writer's belief, based on this data, that *caniceps* would be found a regular—though possibly rare—winter visitant to California, if equally favorable opportunities for observation were afforded each winter. The lack of mountain collecting in the winter months, and the rarity of similar snow conditions, have in all probability accounted for the previous dearth of California records of this species.—DONALD R. DICKEY, *Pasadena, California, May 30, 1922.*

#### RECORD OF BIRDS BANDED

Bands:	5701-5708	9726-9730	12336-12344	24801-24805	32885-32889	56433
	6612-6650		12346-12368	24807-24835	32891	
J. E. Law, at Los Angeles, Calif., November 28, 1921, to May 26, 1922.						
Carpodacus m. frontalis, (22) 6615-17, Pipilo c. senicula, (1) 32885.						
-29, -41, -42, 6647-6650, 12352, Zonotrichia coronata, (1) 6626.						
12359-12361, 24810, -13, -15, 24817- Zonotrichia leucophrys (subsp.), (48)						
24822. 6612, -14, -16, -18, -20, -21, -23, -24, -25,						
Dendroica a. auduboni, (1) 6622. -27, -28, 6630-6637, 6643, -46, 12341, -42,						
Melospiza m. cooperi, (4) 6619, 24830, -50, -51, -53, -54, -55, -56, -58, 12362-						
48129, -30. 12368, 24804, -09, -11, -12, -23, -24.						
Mimus p. leucopterus, (1) 32886.						
At Altadena, Calif., December 7, 1921, to May 30, 1922.						
Chamaea f. henshawi, (5) 6639, 24805, Pipilo m. megalonyx, (2) 12343, -49.						
-07, -08, -14. Thryomanes b. charienturus, (5) 24831-						
Cinclus m. unicolor, (1) 56433. 24835.						
Hylocichla guttata (subsp.), (2), 6638, Toxostoma r. redivivum, (5) 9726-9730.						
12357. Zonotrichia coronata, (13) 6613, -40, -44,						
Junco o. thurberi, (1) 12344. -45, 24801, -02, -03, -16, 24825-24829.						
Mimus p. leucopterus, (1) 12348.						
Pipilo c. senicula, (5) 12346, -47, 32888,						
-89, -91.						
Ernest P. Walker, at Beardslee Island, Glacier Bay, Alaska, August 3, 1921.						
Larus glaucescens, (3) 5701-5703.						
At South Marble Island, Glacier Bay, Alaska, August 5, 1921.						
Larus glaucescens, (5) 5704-5708.						

## EDITORIAL NOTES AND NEWS

The annual Cooper Club roster appearing in the present issue of THE CONDOR, shows a total membership of 800. This is a six per cent increase over last year, and, of course, is larger than ever before. For the compilation of this directory, which experience has shown to be a very useful feature of our annual volume, the Club is indebted to Mrs. J. Eugene Law.

The best index to current ornithological

literature in the world today, we believe, is that comprised in the "Recent Literature" department of *The Auk*. The editor of this journal, Dr. Witmer Stone, with the advantage of the excellent literary facilities at the Academy of Natural Sciences of Philadelphia, has proven himself able to cover the literature of every country with remarkable thoroughness. Rarely does a title come to light which he has missed. Especially useful is it to have a clue to articles

which are widely scattered, often effectively hidden, in various publications other than the regular ornithological journals.

Ornithological work we happen to know to be in progress relative to western North America includes the following: By Joseph Mailliard, further studies on the local migrations and distribution of birds in the northwest coast district of California; by Walter P. Taylor and Prof. W. T. Shaw, the distribution and habits of the birds of Washington; by Joseph Grinnell and Tracy I. Storer, the natural history of Yosemite birds; by Allan Brooks and Harry S. Swarth, the distribution and systematic status of the birds of British Columbia; by Donald R. Dickey and A. J. van Rossem, the systematic status of various birds of southern California; by J. Eugene Law, the birds of the Chiricahua Mountains, Arizona; by Loye H. Miller, the fossil birds of the McKittrick asphalt deposits; by Joseph Grinnell, the birds of Death Valley.

An editorial in the Berkeley "Gazette" for April 24, 1922, is so good, the points made appeal to us as so well taken, that we give the gist of it here. "The Department of Agriculture is now experimenting with various kinds of gas as a means of destroying noxious insects, mammals and birds. . . . A test is to be made, probably with chlorine, on the destructive blackbirds of the Imperial Valley. The plan is to overwhelm them with a gas cloud at night while they are roosting in the marshes. Other plans contemplate the slaughter of grasshoppers, locusts, etc., by similar clouds, used precisely as the gas was used against hostile armies. It is a hopeful adaptation of destructive weapons to constructive purpose, but one to be used with extreme caution. Aside from the danger to the wielder of the weapon, there is the same objection to gas in peace as in war—it is likely to kill noncombatants along with enemies. This is true alike of mammals, birds and insects. The gas may annihilate them all, the beneficent along with the rest, and often it is difficult to say in which class any particular creature belongs. Many a well-meant effort at riddance of a pest has brought a worse evil, by interfering ignorantly with the fine balance of nature. Any farmer contemplating a gas-cloud assault along his crop front had better wait until the experimenting has gone farther."

Everyone who has any sympathetic regard for the sport of bird photography should see the illustrated article by Robert B. Rockwell and Clark Blickensderfer, in *Natural History* (American Museum of Natural History, New York, xxi, 1921, pp. 626-638). Remarkable success was won by

these men in picturing the home life of the elusive Saw-whet Owl in the mountains of Colorado. The eighteen excellent photographs published with the article betoken a degree of patience and skill that only a person who has made attempts along similar lines can fully appreciate.

#### PUBLICATIONS REVIEWED

PHILIPPINE BIRDS FOR BOYS AND GIRLS. By Richard C. McGregor and Elizabeth J. Marshall; with illustrations by Macario Ligaya. Manila (Bureau of Printing), pp. 1-138, many plates (colored) and text figures.

Thirty presumably common species of Philippine birds are treated in brief chapters, giving for each certain outstanding features of its life history. The book is written "for boys and girls", as indicated by the title, and apparently for very small boys and girls. Brief appendices giving additional information regarding the birds described, and with references to bird literature, will be valuable to teachers using the volume as a text book. This is a new departure for the senior author, in rather startling contrast to the technical articles with which we are used to associate his name. It brings to the mind one feature of a cartoon that appeared in *THE CONDOR* of March, 1901.—H. S. SWARTH.

#### MINUTES OF COOPER CLUB MEETINGS

##### NORTHERN DIVISION

APRIL.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology on April 27, 1922, at 8 p. m. President Swarth was in the chair, and the following members were present: Mesdames Allen, Bennet, Blake, Bogle, Culver, Davenport, Flinn, Grinnell, Mead, Reygadas, Thomson and Van Gaasbeek; Messrs. Bell, Dixon, Evermann, Grinnell, Willard Grinnell, Mailliard, Miller, Storer, Strong, Torrey and White. Among the visitors were Mrs. Evermann, Mr. and Mrs. Hagedoorn, Mrs. Thomson and Prof. Kingsley.

After the reading and approval of the March minutes, the minutes of the Southern Division for February and March were read. Mr. Vernon L. Tenney, 2536 Etna Street, Berkeley, was proposed for membership by Dr. William F. Bade.

Professor Kingsley then gave an account of naturalists he had known, using photographs for illustrative material. Adjourned.—AMELIA S. ALLEN, *Secretary*.

## SOUTHERN DIVISION

MARCH.—Regular monthly meeting of Cooper Ornithological Club, Southern Division, was held at 8:00 p. m. at the usual place. Dr. Rich was in the chair, and in the absence of the regular secretary he appointed Mr. Little secretary pro tem. Others present were as follows: Mrs. Law; Miss Miller and Miss Pratt; Messrs. Appleton, Bishop, Brown, Chambers, Hannaford, Holland, Howell, King, Lamb, Law, Miller, Nokes and van Rossem. Visitors were: Mesdames Bishop, Howell and Raymond, and Miss Swarth.

Minutes of January and February meetings were read and approved. Membership applications were as follows: Dr. George T. McKeough, Blenkerin, Ontario, Canada; John D. Houghton, care Dr. J. W. Flinn, Prescott, Arizona; Harry H. Sheldon, care Commercial Trust & Savings Bank, Santa Barbara; and Hamilton Gamble, 476 8th Ave., San Francisco, all by W. Lee Chambers; David L. MacKaye, Tulare, Calif., by L. E. Wyman. From the Northern Division came the following: Mrs. W. S. Davenport, Berkeley; Philip Kloss, Piedmont; and Mrs. Adeline Frederick, Berkeley.

Dr. Miller then presented an interesting paper on "Recent Things on Fossil Birds". The peculiar relations, in wing markings, of the Glaucous-winged and Thayer Gulls were demonstrated and discussed by Dr. Bishop. The meeting closed with the usual informal discussion of subjects ornithological. Adjourned.—LUTHER LITTLE, *Secretary pro tem.*

# DIRECTORY OF MEMBERS OF THE COOPER ORNITHOLOGICAL CLUB

Revised to June 1, 1922

## OFFICERS

## NORTHERN DIVISION

President, Harry S. Swarth  
Vice-President, J. S. Cooper  
Secretary, Mrs. Amelia S. Allen

## SOUTHERN DIVISION

President, Guy C. Rich  
Vice-President, Wright M. Pierce  
Secretary, L. E. Wyman

## EDITORS

Joseph Grinnell  
Harry S. Swarth

## BUSINESS MANAGERS

J. Eugene Law  
W. Lee Chambers

## ENDOWMENT SECRETARY

A. Brazier Howell

The above officers, together with the fol-

lowing ex-presidents (not included above, all those whose membership has been continuous since incumbency) constitute the Board of Governors of the Club.

Ralph Arnold, Harold C. Bryant, Henry W. Carriger, Herbert L. Coggins, Barton Warren Evermann, Walter K. Fisher, Ozra W. Howard, Joseph Mailliard, Loye H. Miller, G. Frean Morcom, Wilfred H. Osgood, Howard Robertson, Tracy I. Storer.

## MEMBERS

In the following roster, residence is understood to be in California unless otherwise indicated. Year following address indicates date that member joined the Club; year in parenthesis indicates date member became honorary or life member. Star (\*) preceding indicates life member; "\$" indicates contributor to Endowment Fund.

## HONORARY MEMBERS

- \*\$Bailey, Florence M. (Mrs. Vernon), 1834 Kalorama Road, Washington, D. C. 1910 (1920).
- Henshaw, H. W., Biol. Survey, Washington, D. C. 1909.
- Merriam, Dr. C. Hart, 1919 16th St., Washington, D. C. 1909.
- Nelson, E. W., Biol. Survey, Washington, D. C. 1904 (1917).
- Ridgway, Robert, 3306 New Hampshire Ave., N. W., Washington, D. C. 1905.
- \$Stephens, Frank, 3746 Park Blvd., San Diego. 1894 (1912).

## ACTIVE MEMBERS

- Abbott, Clinton G., Nat. Hist. Museum, Balboa Park, San Diego. 1921.
- Abernathy, Frieda (Mrs. St. E.), 2300 Durant Ave., Berkeley. 1914.
- Adams, Benjamin, Wethersfield, Conn. 1920.
- Adams, Miss Romola M., 912 Linden Ave., Long Beach. 1921.
- Alexander, Miss Annie M., Suisun. 1908.
- Alexander, E. Gordon, 1603 South St., Lexington, Mo. 1918.
- Allen, Dr. Arthur A., McGraw Hall, Ithaca, N. Y. 1911.
- Allen, Mrs. Amelia S., 37 Mosswood Road, Berkeley. 1913.
- Anderson, Mrs. Malcolm P., 2809 Buena Vista Way, Berkeley. 1920.
- Anderson, Dr. Rudolph M., Biol. Div., Victoria Memorial Museum, Ottawa, Ont., Canada. 1916.
- Andrews, E. R., Apt. 14, 1048 Union St., San Francisco. 1920.
- Anthony, A. W., Nat. Hist. Museum, Balboa Park, San Diego. 1921.
- Applegate, Elmer I., Klamath Falls, Ore. 1921.

- \*Appleton, J. S., 1332 Citrus Ave., Hollywood. 1901 (1919).
- Armstrong, Edward E., 2249 Calumet Ave., Chicago, Ill. 1914.
- Arnold, E., Grand Trunk Ry., Montreal, Que., Canada. 1909.
- Arnold, Mrs. Lewis, 2732 Benvenue Ave., Berkeley. 1921.
- Arnold, Dr. Ralph, 639 S. Spring St., Los Angeles. 1893.
- Arnold, Dr. W. W., 504 N. Nevada Ave., Colorado Springs, Colo. 1911.
- Atkinson, W. L., 35 Hawthorne Way, San Jose. 1901.
- Atsatt, Miss Sarah R., 345 S. Serrano Ave., Los Angeles. 1911.
- Austin, Miss Dorothy K., 85 S. Madison Ave., Pasadena. 1921.
- Averill, Charles Ketchum, 406 Stratford Ave., Bridgeport, Conn. 1922.
- Ayer, Ethel C., 1301 Jackson St., Oakland. 1920.
- Bacon, Brasher C., Madisonville, Ky. 1921.
- Bade, Wm. F., 2616 College Ave., Berkeley. 1903.
- Badger, M. C., Santa Paula. 1915.
- Bailey, Alfred M., Colo. Museum Nat. Hist., Denver, Colo. 1917.
- Bailey, Bernard, R.D. 1, Elk River, Minn. 1911.
- Bailey, H. H., Box 5, Miami Beach, Miami, Fla. 1903.
- Bailey, Vernon, 1834 Kalorama Road, Washington, D. C. 1904.
- Baker, Chas. H., 594 13th St., Oakland. 1921.
- \*Baldwin, S. P., 2930 Prospect Ave., Cleveland, Ohio. 1920 (1920).
- §Bales, Dr. B. R., 149 W. Main St., Circleville, Ohio. 1906.
- Ballard, Mrs. Maria V., 295 12th St., Portland, Ore. 1919.
- Bamford, Mrs. G. L., 1428 Castro St., Oakland. 1918.
- Bancroft, Griffing, Cuyamaca Club, San Diego. 1920.
- §Bangs, Outram, Museum Comp. Zool., Cambridge, Mass. 1906.
- Barker, Fred, Parkers Prairie, Minn. 1914.
- Barnes, C. A., 1815 S. Western Ave., Los Angeles. 1921.
- Barnes, Claude T., 359 10th Ave., Salt Lake City, Utah. 1915.
- Barnes, Frances V., 1815 S. Western Ave., Los Angeles. 1921.
- \*§Barnes, R. Magoon, Lacon, Ill. 1908 (1921).
- Barrows, Prof. Walter B., Box 1047, East Lansing, Mich. 1909.
- Bartlett, Mrs. Adelaide R., Assessors Office, City Hall, San Francisco. 1922.
- Bassett, F. N., 1338 8th St., Alameda. 1919.
- Batchelder, Chas. F., 7 Kirkland St., Cambridge, Mass. 1910.
- Bates, Josephine J., 1267 Sunset Ave., Pasadena. 1921.
- \*§Beck, Rollo H., R.D. 21, San Jose. 1894 (1919).
- Beers, Miss Catherine V., Univ. Southern Calif., Los Angeles. 1921.
- Bell, Archibald W., 2423 Oregon St., Berkeley. 1922.
- Bell, B. C., 235 8th St., San Francisco. 1919.
- Benjamin, Elbert, 109 Coral St., Los Angeles. 1920.
- Bennet, Eleanor V. V., 2904 Piedmont Ave., Berkeley. 1920.
- Bennett, R. H., 216 Market St., San Francisco. 1909.
- Bent, A. C., 140 High St., Taunton, Mass. 1909.
- Benton, Thos. H., Jr., 3200 Liberty Ave., Alameda. 1916.
- Bergtold, Dr. W. H., 1159 Race St., Denver, Colo. 1917.
- Betterley, Bertram O., 2005 2nd St., Eureka. 1922.
- Bicknell, Mrs. F. T., 319 S. Normandie Ave., Los Angeles. 1913.
- Bigelow, Homer L., 37 Old Orchard Road, Chestnut Hill, Mass. 1910.
- \*Bishop, Dr. Louis B., 5956 Hollywood Blvd., Hollywood. 1904 (1920).
- Blake, Mrs. Edwin T., 2233 Piedmont Ave., Berkeley. 1917.
- Blayney, Nita A., 920 O St., Fresno. 1911.
- Bliss, John D., Pozo, San Luis Obispo Co. 1916.
- Boeing, W. E., The Highlands, R.D. 2, Seattle, Wash. 1914.
- Bogle, Mrs. Sara S., 2520 Hillegass Ave., Berkeley. 1921.
- Bolander, L. Ph., Jr., 1947 E. 28th St., Oakland. 1907.
- Bolt, B. F., 1421 Prospect Ave., Kansas City, Mo. 1916.
- Borell, Adrey E., 227 Calaveras Ave., Fresno. 1918.
- Bowden, R. E., Bozeman, Mont. 1921.
- Bowdish, B. S., Demarest, N. J. 1910.
- Bowles, J. H., The Woodstock, Tacoma, Wash. 1903.
- Boyle, Ashby D., 380 E St., Salt Lake City, Utah. 1915.
- Boyle, Miss Una, 132 Laurel Place, San Rafael. 1921.
- Boynton, Charles T., 1005 S. Sheridan Road, Highland Park, Ill. 1919.
- \*§Bradbury, W. C., 1440 Race St., Denver, Colo. 1913 (1914).

- Braislin, Dr. William C., 425 Clinton Ave., Brooklyn, N. Y. 1910.
- Bramkamp, Richard, Banning. 1921.
- Brandt, H. W., 2025 E. 88th St., Cleveland, Ohio. 1914.
- Bridges, Mrs. Harriette W., 5939 Shafter Ave., Oakland. 1918.
- \*Brooks, Allan, Okanagan Landing, B. C., Canada. 1906 (1920).
- Brooks, L., Box 539, New Bedford, Mass. 1913.
- Brouse, W. A., 3623 5th Ave., Los Angeles. 1916.
- Brown, D. E., 87 Lenora St., Seattle, Wash. 1909.
- \*Brown, Edward J., 222 W. 47th Pl., Los Angeles. 1915.
- Brown, G. Franklin, Needham, Mass. 1918.
- Brown, Mrs. Herbert, 434 E. 2d St., Tucson, Ariz. 1914.
- Brown, Miss Nellie M., 810 Brockman Bldg., Los Angeles. 1922.
- Brown, Mrs. William C., 945 Orange St., Los Angeles. 1921.
- Brownlee, Mrs. Marie P., 714 Grosse Bldg., Los Angeles. 1919.
- Brune, Leo, Grand Dalles, Wash. 1919.
- Bryan, William Alanson, Museum Hist., Sci., and Art, Los Angeles. 1921.
- Bryant, Dr. Carl H., Atascadero. 1922.
- Bryant, Chas. A., Room 1028 S. P. Bldg., 65 Market St., San Francisco. 1922.
- §Bryant, Dr. Harold C., Museum Vert. Zool., Berkeley. 1910.
- Buhn, Mrs. Minnie, 1025 Pearl St., Alameda. 1921.
- Bull, Daniel Bernard, R.D. A, Box 158, San Jose. 1919.
- Bull, Mrs. D. Bernard, R.D. A, Box 158, San Jose. 1921.
- Bunker, Paul F., 1913 Woolsey St., Berkeley. 1922.
- Burk, Genevieve S., 1601 Oxford St., Berkeley. 1920.
- Burleigh, Thos. D., Univ. Ga., Athens, Ga. 1918.
- Burnell, Miss Elizabeth, 419 S. Olive St., Los Angeles. 1921.
- Burnett, W. L., State Agr. Coll., Fort Collins, Colo. 1910.
- Burnham, Dr. Clark, Bushnell Place, Berkeley. 1907.
- Burnham, John, Timken Bldg., San Diego. 1920.
- Burns, Frank L., Berwyn, Pa. 1909.
- Burns, James R., 645 44th St., Des Moines, Ia. 1922.
- Burtch, Verdi, Branchport, N. Y. 1910.
- Cahn, Alvin R., Biol. Dept., Texas A. and M. College, College Station, Tex. 1922.
- Calder, James A., Buena Park. 1917.
- Camp, Chas. L., Bacon Hall, Univ. Calif., Berkeley. 1909.
- Canby, Caroline P., San Fernando. 1921.
- Canfield, Mrs. May, 2875 Clay Ave., San Diego. 1922.
- Cantwell, George G., Puyallup, Wash. 1915.
- Carpenter, George I., 129 Dean St., Brooklyn, N. Y. 1920.
- Carpenter, N. K., 3775 Kite St., San Diego. 1901.
- Carriger, H. W., 5185 Trask St., Oakland. 1895.
- Case, Rev. Bert F., East Granby, Conn. 1913.
- Case, C. M., 306 Blue Hills Ave., Hartford, Conn. 1911.
- Case, Walter M., Box 399, Prescott, Ariz. 1921.
- §Chamberlain, C. W., 36 Lincoln St., Boston, Mass. 1912.
- \*Chambers, W. Lee, Eagle Rock. 1897 (1919).
- Chapman, Frank M., Amer. Museum Nat. Hist., New York, N. Y. 1903.
- Cheesman, M. R., R.D. 1, Rivera. 1919.
- Cheney, E. S., 1838 4th Ave., Oakland. 1920.
- Cheney, Miss Mary, South Manchester, Conn. 1919.
- Clark, Josiah H., 702 E. 23d St., Paterson, N. J. 1910.
- Cleaves, H. H., Nat. Hist. Museum, Balboa Park, San Diego. 1921.
- Clifton, H. T., 509 E. Walnut St., Pasadena. 1904.
- Coale, Henry K., Highland Park, Ill. 1907.
- Coffin, Robert L., Mass. Agr. Exp. Station, Amherst, Mass. 1920.
- Coggins, Herbert L., 2929 Piedmont Ave., Berkeley. 1910.
- Cohen, Donald A., 2618 Lincoln St., Alameda. 1901.
- \*§Colburn, A. E., 806 S. Broadway, Los Angeles. 1905 (1915).
- Cole, Mrs. Arthur H., 2827 Hillegass Ave., Berkeley. 1917.
- Cole, F. R., Box 26, Palo Alto. 1919.
- Cole, John L., R.D. 5, Nevada, Ia. 1922.
- Coman, Mary C., 1644 Berkeley Ave., Stockton. 1921.
- Compton, Mary J. (Mrs. C. Norman), 6510 1st St. N. E., Seattle, Wash. 1920.
- Comstock, Dr. John, Southwest Museum, Los Angeles. 1920.
- Cook, Fred'k. W., 1604 E. Harrison St., Seattle, Wash. 1919.
- Cooke, Miss M. T., 1328 12th St., Washington, D. C. 1918.
- Cookman, Alfred, 2921 B St., San Diego. 1912.
- Cooley, R. A., Agr. Exp. Sta., Bozeman, Mont. 1921.



- Cooper, J. S., 827 54th St., Oakland. 1903.  
Cope, Francis R., Jr., Dimock, Penn. 1919.  
Coppee, Marie P., Ross, Marin Co. 1921.  
Corwin, Helen G., 2542 Durant Ave., Berkeley. 1922.  
Cox, H. E., care C. H. Reed Co., San Luis Obispo. 1916.  
Cox, Richard, 3d, 1829 Arch St., Berkeley. 1919.  
Cozens, Harold H., 3071 Bateman St., Berkeley. 1921.  
Crane, Ada Ethel, Box 607, Westwood. 1914.  
Craven, Jesse T., 5315 Roosevelt Ave., Detroit, Mich. 1909.  
Crosby, Maunsell S., Grasmere Farms, Rhinebeck, N. Y. 1911.  
Crum, Miss Ethel, Morada Apts., Tulare. 1920.  
Culver, Geo. B., Stanford University. 1921.  
Culver, Susan B., 2423 Prospect St., Berkeley. 1914.  
Cummings, Byron, Univ. Ariz., Tucson, Ariz. 1916.  
Cunningham, Walter, 3009 Dunham Ave., Kansas City, Mo. 1921.  
Currier, Ed. S., 416 E. Chicago St., St. Johns Sta., Portland, Ore. 1904.  
Dart, Mrs. Bertha L., South 6th St., Montevideo, Minn. 1922.  
Davenport, Mrs. Elizabeth B., Northern Ave., Brattleboro, Vt. 1911.  
Davenport, Mrs. W. S., 2730 Stuart St., Berkeley. 1922.  
Davidson, Miss Pirie, S. Branch, Univ. Calif., Los Angeles. 1916.  
Davies, A. E., 1327 Grove St., Berkeley. 1920.  
Davis, Dr. Fred B., 401 Vernon St., Oakland. 1916.  
Davis, Henry W., 10 S. Baton Rouge Ave., Atlantic City, N. J. 1922.  
Davis, John M., 737 M St., Eureka. 1908.  
\*Dawson, W. Leon, R.D. 3, Box 83, Santa Barbara. 1906 (1915).  
Dean, W. F., Three Rivers. 1901.  
Deane, Ruthven, 112 W. Adams St., Chicago, Ill. 1904.  
Deane, Wallace A., 1266 Columbia Road, Washington, D. C. 1919.  
Deane, Walter, 29 Brewster St., Cambridge, Mass. 1907.  
Dearborn, Ned, Sackett Harbor, N. Y. 1909.  
Decker, F. R., Kiona, Wash. 1913.  
DeGroot, Dudley S., Normal Hill Center, Los Angeles. 1916.  
Deweese, Miss Elizabeth, Whitehall Rd. and Marshall St., Norristown, Pa. 1922.  
Dice, Dr. Lee R., Museum of Zoology, Ann Arbor, Mich. 1914.  
Dickenson, A. B., R.D. 1, Box 11B, San Gabriel. 1916.  
Dickenson, Mrs. A. B., R.D. 1, Box 11B, San Gabriel. 1919.  
\*Dickey, Donald R., 514 Lester Ave., Pasadena. 1910.  
Dill, Dr. Robert, State Sheep Commission, Reno, Nev. 1921.  
Dille, F. M., Valentine, Neb. 1903.  
Dings, G. M., 2161 Ry. Exch. Bldg., St. Louis, Mo. 1920.  
Disney, Dwight R., Box 278A, Rupert, Idaho. 1920.  
Dixon, Joseph, Museum Vert. Zool., Berkeley. 1904.  
Dodge, Laura I., 3031 Eliot St., Long Beach. 1915.  
Dodge, Ralph E., R.D. 9, Box 468, Exeter. 1915.  
Dodge, Mrs. Rowland B., 64 Panoramic Way, Berkeley. 1920.  
Doolittle, E. A., Box 44, Painesville, Ohio. 1918.  
Drachman, Myra, 3031 Eliot St., Long Beach. 1915.  
Drummond, Mrs. Ella B., 2739 Bancroft Way, Berkeley. 1921.  
DuBois, Alexander Dawes, 327 S. Glenwood Ave., Springfield, Ill. 1911.  
Duprey, H. F., R.D. 1, Box 78B, Dixon. 1907.  
Duffee, Owen, Box 125, Fall River, Mass. 1911.  
Dutton, P. C., 65 High St., Stone Staffs, England. 1913.  
Dwight, Dr. Jonathan, Jr., 43 W. 70th St., New York, N. Y. 1904.  
Easton, Mrs. Jane F., Torrey Road, La Jolla. 1920.  
Eaton, S. Harrison, Box 653, Lawrenceville, Ill. 1916.  
Edson, J. M., Marietta Road, Bellingham, Wash. 1911.  
Edwards, H. Arden, R.D. 1, Box 284, Los Angeles. 1913.  
\*Eggleston, Prof. Julius W., Cuttingsville, Rutland Co., Vt. 1913 (1919).  
Elmore, Louis A., 486 Boulevard, Ashland, Ore. 1920.  
\*Emerson, W. Otto, Palm Cottage, Hayward. 1920 (1921).  
Enochs, Rex P., 715 S. Hope St., Los Angeles. 1921.  
Esterly, Dr. C. O., Occidental College, Los Angeles. 1908.  
Evans, Ella A., Exeter. 1922.  
Evans, Frank C., Crawfordsville, Ind. 1918.  
Evans, J. Harold, R.D. 4, Box 500, Santa Rosa. 1917.  
Evans, Wm. V., Livingston, Mont. 1920.

- Everhart, Mrs. L. U., Thermal. 1922.  
 Evermann, Dr. Barton W., Cal. Acad. Sciences, San Francisco. 1911.  
 Falger, Annie M. (Mrs. Wm.), Modesto. 1917.  
 Farber, William P., 2605 Etna St., Berkeley. 1921.  
 Fargo, Mrs. Minerva J., 1632 N. Kingsley Drive, Los Angeles. 1914.  
 Farnsworth, Dean, 1009 Manning St., Winfield, Kan. 1921.  
 Felger, A. H., North Side High School, Denver, Colo. 1920.  
 Felton, Mrs. C. N., 216 Pine St., San Francisco. 1916.  
 \*Ferguson, Mrs. Aurelia B., 999 Gramercy Drive, Los Angeles. 1922.  
 Ferguson, Mrs. Mary Van E., 5 Panoramic Way, Berkeley. 1915.  
 Field, Clyde, 1859 Julian Ave., San Diego. 1919.  
 Field, Geo. R., Requa, Del Norte Co. 1921.  
 Finley, Wm. L., Jennings Lodge, Ore. 1900.  
 Fish, Mrs. Frances Webster, 6215 Chabot Road, Oakland. 1917.  
 Fisher, Dr. A. K., Biol. Survey, Washington, D. C. 1904.  
 Fisher, Miss Elizabeth W., 2222 Spruce St., Philadelphia, Pa. 1910.  
 Fisher, Prof. Walter K., Stanford Marine Laboratory, Pacific Grove. 1900.  
 Fitzpatrick, T. J., Bethany, Neb. 1913.  
 Fleming, J. H., 267 Rusholme Road, Toronto, Ont., Canada. 1910.  
 Fletcher, Lyle R., 353 N. Archer St., Norton, Kas. 1920.  
 Flinn, Catherine Mills, 1799 University Ave., Berkeley. 1920.  
 Flynn, Helen, 1546 Shattuck Ave., Berkeley. 1920.  
 Forbush, E. H., State House, Boston, Mass. 1916.  
 Forrest, Earle R., 205 N. Main St., Washington, Pa. 1910.  
 Fortiner, John C., Box 496, Brawley. 1910.  
 Fowler, Frederick H., 221 Kingsley Ave., Palo Alto. 1901.  
 Frank, Arthur, W. Wash. Exp. Sta., Puyallup, Wash. 1920.  
 Frazer, J. Thomas, Jr., 432 W. Hawthorne St., Eureka. 1920.  
 Frederick, Mrs. Adeline, 1636 Woolsey Ave., Berkeley. 1922.  
 Freeman, John G., Box 1238, Brawley. 1922.  
 French, Mrs. A. J., Carlton, Ore. 1921.  
 French, James G., The Menagerie, 3628 Saanich Road, Victoria, B. C., Canada. 1918.  
 Frye, Prof. T. C., Univ. Wash., Seattle, Wash. 1919.  
 Fuertes, Louis A., 201 Wyckoff Ave., Ithaca, N. Y. 1904.  
 Gabrielson, Ira N., 515 P. O. Bldg., Portland, Ore. 1919.  
 Gallup, Frederick Norman, Escondido. 1921.  
 Gamble, Hamilton, 476 8th Ave., San Francisco. 1922.  
 Ganier, Albert F., 2507 Ashwood Ave., Nashville, Tenn. 1921.  
 Gartrell, Geo. N., Summerland, B. C., Canada. 1917.  
 Gault, Benj. T., 564 N. Main St., Glen Ellyn, DuPage Co., Ill. 1905.  
 Gay, Harold S., 200 S. Wilson Ave., Alhambra. 1901.  
 Geiselhart, Miss Josephine, Concord. 1920.  
 Germain, Miss Claire, Balboa. 1915.  
 Giannini, Chas. A., Poland, N. Y. 1919.  
 Gifford, Dr. Harold, 420 S. 36th St., Omaha, Neb. 1916.  
 Gignoux, Claude, 73 Tunnel Road, Berkeley. 1919.  
 Gilchrist, Francis G., 240 Webster St., San Francisco. 1920.  
 Giles, Roscoe I., 82 Newton St., Marlborough, Mass. 1917.  
 Gilman, M. French, Banning. 1901.  
 Girvin, F. H., Brawley Hardware Co., Brawley. 1919.  
 Goelitz, Herman, 944 Alameda Drive, Portland, Ore. 1920.  
 \*Goelitz, Walter A., 170 Nunda Blvd., Rochester, N. Y. 1915 (1920).  
 Goethe, C. M., Capital Natl. Bank Bldg., Sacramento. 1915.  
 Goldman, E. A., Biol. Survey, Washington, D. C. 1901.  
 Goldman, Luther J., Biol. Survey, Boise, Idaho. 1902.  
 Goodcell, Mrs. Marion L., 864 D St., San Bernardino. 1914.  
 Gormley, A. L., Box 80, Arnprior, Ont., Canada. 1918.  
 Grant, U. S., 4th, 749 S. Gramercy Pl., Los Angeles. 1909.  
 Green, Thos. L., 7076 Franklin Ave., Hollywood. 1921.  
 Grey, Henry, R.D. 2, Box 154A, San Diego. 1901.  
 Griffee, Bill, R.D. 3, Box 68, Corvallis, Ore. 1919.  
 Grinnell, Geo. Bird, 238 E. 15th St., New York, N. Y. 1914.  
 \*Grinnell, Hilda Wood (Mrs. Joseph), 2811 College Ave., Berkeley. 1912 (1921).  
 \*Grinnell, Dr. Joseph, Museum Vert. Zool., Berkeley. 1894 (1919).  
 Grinnell, Willard Fordyce, 2811 College Ave., Berkeley. 1921.  
 Guion, Geo. Seth, Napoleonville, La. 1911.

- Gunn, Miss Amy E., 1342 Filbert St., San Francisco. 1914.
- Gunthorp, Horace, Univ. Wash., Seattle, Wash. 1920.
- Guthrie, Miss Esther, 2201 H St., Sacramento. 1918.
- Hadeler, E. W., Painesville, Ohio. 1918.
- Hall, Mrs. Carlotta C., 1615 La Loma Ave., Berkeley. 1915.
- Hall, Mrs. C. H., 512 W. 30th St., Los Angeles. 1921.
- Halladay, Daniel S., R.D. 3, Box 201, Anaheim. 1910.
- Hallinen, J. E., Cooperton, Kiowa Co., Okla. 1921.
- Hanaford, A. W., R.D. 9, Box 1210, Los Angeles. 1917.
- Hands, Frank H., Dos Cabezas, Ariz. 1920.
- Hanford, Forrest, 3825 Division St., Oakland. 1912.
- Hann, H. H., Parkdale, Ore. 1909.
- Hanna, Dr. G. Dallas, Cal. Acad. Sciences, San Francisco. 1921.
- \*Hanna, W. C., 1000 Pennsylvania Ave., Colton. 1902 (1921).
- Harlow, Richard C., 369 Foster Ave., State College, Penn. 1919.
- Harmon, Mrs. Frances M., 2115 Estrella Ave., Los Angeles. 1912.
- Harper, Francis, Cornell Univ., Ithaca, N. Y. 1920.
- \*Harris, Harry, 18 W. 52d St., Kansas City, Mo. 1914 (1919).
- Harrison, H. M., 319 Penn St., Camden, N. J. 1920.
- Hart, Cecil, R.D. 6, Box 432, Los Angeles. 1920.
- Hartman, Paul J., 1118½ Maple Ave., Los Angeles. 1917.
- Hathaway, H. S., Box 1466, Providence, R. I. 1912.
- Havemeyer, Henry O., 129 Front St., New York, N. Y. 1917.
- Hayes, Mrs. F. M., Box 591, Davis. 1919.
- Haynes, Mrs. A. H., 1734 University Ave., St. Paul, Minn. 1921.
- Head, Miss Anna, 2809 Forest Ave., Berkeley. 1912.
- Heath, Prof. Harold, 1147 Ramona St., Palo Alto. 1919.
- Hedges, Chas. F., Box 24, Miles City, Mont. 1919.
- Hegner, Carl D., 810 Avoca St., Los Angeles. 1914.
- Heineman, Oluf J., 1664 Grove St., San Francisco. 1908.
- Heller, Edmund, Field Museum Nat. Hist., Chicago, Ill. 1894.
- Helme, Arthur H., Miller Place, Suffolk Co., N. Y. 1911.
- Henderson, Dr. H. C., Casitas Road, Carpinteria. 1919.
- Henderson, Junius, 627 Pine St., Boulder, Colo. 1909.
- Henderson, Walter C., Biol. Survey, Washington, D. C. 1918.
- Hendren, Miss Elizabeth, Occidental. 1920.
- Henshaw, Judge F. W., 762 Mills Bldg., San Francisco. 1915.
- \*Hersey, F. Seymour, 6 Maple Ave., Taunton, Mass. 1915 (1920).
- Hersey, L. J., Wray, Colo. 1909.
- Hill, James H., Box 485, New London, Conn. 1919.
- Hill, Willard, Star Route, Wasco, Kern Co. 1918.
- Hilton, Dr. W. A., Claremont. 1921.
- Hoffman, Louis E., Box Cor. Benner and Shults St., Los Angeles. 1920.
- Hoffmann, Ralph, Carpinteria. 1920.
- Hohfeld, Mrs. Edward, 754 3d Ave., San Francisco. 1920.
- \*Holland, Harold M., Box 515, Galesburg, Ill. 1901 (1920).
- Holleman, Ridley, 205 Duffield St., San Antonio, Texas. 1917.
- Hollister, N., Nat. Zool. Park, Washington, D. C. 1920.
- Holman, F. C., 866 Post St., San Francisco. 1914.
- \*Hoover, Theodore J., 450 Melville Ave., Palo Alto. 1898 (1916).
- Hornung, Dr. John, 5219 Wilton Place, Los Angeles. 1920.
- Horsfall, R. Bruce, 324½ S. Broadway, Portland, Ore. 1914.
- Horsfall, Mrs. R. Bruce, Reed College Library, Portland, Ore. 1916.
- Houghton, John D., care Dr. J. W. Flinn, Prescott, Ariz. 1922.
- Howard, O. W., Box 484, Los Angeles. 1895.
- \*§Howell, A. B., 770 S. Pasadena Ave., Pasadena. 1908 (1915).
- Howell, Arthur H., 2919 S. Dakota Ave., Washington, D. C. 1916.
- Howell, B. F., Jr., 52 Patton Ave., Princeton, N. J. 1909.
- Howes, Paul G., 46 Auldwood Road, Stamford, Conn. 1910.
- Huber, Wharton, 225 St. Marks Square, Philadelphia, Pa. 1915.
- Huddleston, Mrs. Alice M., R.D. 1, Box 539, San Gabriel. 1921.
- Hudson, L. W., 2524 Belmont Ave., Fresno. 1917.
- \*Huey, Laurence, 2875 Clay Ave., San Diego. 1909 (1921).
- Hunt, C. J., 5847 W. Superior St., Chicago, Ill. 1919.

- Hunt, Richard, Museum Vert. Zool., Berkeley. 1918.
- Hunter, J. S., Box 482, San Mateo. 1903.
- Hurley, John B., 225 East E St., Yakima, Wash. 1921.
- Husher, Mrs. Gertrude H., 821 S. Hope St., Los Angeles. 1913.
- Hyde, Mrs. Chas. Gilman, 2579 Buena Vista Way, Berkeley. 1921.
- Hyde, Mrs. Silkman E., Regena, Idaho. 1922.
- Illingsworth, J. F., Univ. Hawaii, Honolulu, T. H. 1896.
- Illo, Howard C., 11th and Main Sts., Los Angeles. 1920.
- Ingersoll, Albert M., 908 F St., San Diego. 1895.
- Jackson, Hartley H. T., Biol. Survey, Washington, D. C. 1921.
- Jackson, Ralph W., R.D. 1, Cambridge, Md. 1917.
- Jacobs, J. Warren, 404 S. Washington St., Waynesburg, Pa. 1909.
- Jacobsen, W. C., 2319 M St., Sacramento. 1916.
- Jay, Antonin, 1622 Pennsylvania Ave., Los Angeles. 1901.
- Jenkins, Ida G., 30 Dearborn St., Roxbury, Mass. 1914.
- Jenney, Chas. F., 100 Gordon Ave., Hyde Park, Mass. 1917.
- Jesurun, Dr. Mortimer, 802 American Ave., Long Beach. 1916.
- Jewett, Stanley G., 582 Bidwell Ave., Portland, Ore. 1909.
- Job, Herbert K., 601 Washington Ave., West Haven, Conn. 1915.
- Johnson, A. C., Whittier Nat. Bank, Whittier. 1919.
- Johnson, Miss Clare E., Room 151, City Hall, San Francisco. 1921.
- Johnson, Frank Edgar, 16 Amackassin Terrace, Yonkers, N. Y. 1911.
- Johnson, H. H., Pittsfield, Me. 1920.
- Johnson, Dr. Myrtle E., National City. 1908.
- Johnston, Ivan Murray, W. 8th St., Upland. 1920.
- Johnstone, W. B., Edgewood, B. C., Canada. 1918.
- Jonas, Coloman, 1023 Broadway, Denver, Colo. 1910.
- Jonas, John, 215 W. Park St., Livingston, Mont. 1921.
- Jones, Dr. Lombard Carter, Falmouth, Mass. 1918.
- Jones, Dr. Lynds, Museum Oberlin Coll., Oberlin, Ohio. 1911.
- Jordan, A. H. B., Everett, Wash. 1911.
- Jordan, Dr. David Starr, Stanford University. 1902.
- Joy, Emmet, San Andreas. 1920.
- Judson, W. B., 826 Washington Bldg., Los Angeles. 1901.
- Kaeding, Geo. L., 104 N. Columbus Ave., Glendale. 1903.
- Kell, Delacourt, Claremont. 1921.
- Keeler, Leonarde, 155 El Camino Real, Berkeley. 1922.
- Kelley, Mrs. Harriet P., 2505 Logan St., Selma. 1917.
- Kellogg, Miss Louise, Box 248, Suisun. 1911.
- Kellogg, Miss Mildred, 2232 Piedmont Ave., Berkeley. 1921.
- Kellogg, Ralph T., Silver City, N. M. 1916.
- Kellogg, Prof. Vernon L., Stanford University. 1901.
- Kelly, Junea W. (Mrs. G. E.), 1311 Grand St., Alameda. 1918.
- \*Kennard, Frederick H., Dudley Road, Newton Centre, Mass. 1911 (1916).
- Kennedy, Clarence H., Zool. Dept., Ohio State Univ., Columbus, Ohio. 1912.
- Kennedy, Miss Eveline, 5330 Pasadena Ave., Los Angeles. 1921.
- Keyes, Prof. Chas. R., Mt. Vernon, Iowa. 1900.
- Kibbe, A. S., 1534 Grove St., Berkeley. 1917.
- Kibbe, Bessie W. (Mrs. A. S.), 1534 Grove St., Berkeley. 1917.
- Kimball, H. H., Seal Beach. 1909.
- King, Albert H., 3612 N. Griffin Ave., Los Angeles. 1920.
- King, Benjamin H., 1215 Lakeshore Drive, Coeur d'Alene, Idaho. 1921.
- Kirn, Albert J., R.D. 4, Solomon, Kas. 1918.
- Kitchin, E. A., 4014 N. 35th St., Tacoma, Wash. 1917.
- Kitt, W. Stanley, 129 S. 5th Ave., Tucson, Ariz. 1921.
- Kittredge, Joseph, Jr., U. S. Forest Service, Washington, D. C. 1915.
- Kloss, Philip, 24 Greenbank Ave., Piedmont. 1922.
- Kluegel, Mrs. Edward A., Carmel. 1916.
- Knickerbocker, Chas. K., 445 N. Sacramento Ave., Carpenter Sta., Chicago, Ill. 1905.
- Knowlton, Dr. F. H., U. S. Nat. Museum, Washington, D. C. 1910.
- Kofoid, Prof. C. A., Zool. Dept., Univ. Calif., Berkeley. 1909.
- Kohler, Louis S., R.D. 2, Paterson, N. J. 1909.
- Krehbiel, Leonard, Box 743, Upland. 1919.
- Kretzman, Prof. P. E., 3705 Texas Ave., St. Louis, Mo. 1914.
- Kuser, John Dryden, Bernardsville, N. J. 1912.
- Kuykendall, W. A., Eugene, Ore. 1916.

- Labarthe, Jules, 2727 Russell St., Berkeley. 1914.
- La Jeunesse, H. V., 2517 Webb St., Alameda. 1916.
- Lalage, Emily Dolores, 2253 Encinal Ave., Alameda. 1922.
- Lamb, Chester C., 549 W. 43d Place, Los Angeles. 1899.
- Lancashire, Sarah H. (Mrs. J. Henry), Graftonwood, Manchester, Mass. 1911.
- Lander, Bessie M., R.D. 1, Box 106, Strathmore. 1920.
- Lane, Geo. W., Morgan Hill. 1914.
- Langevin, Elmer, 325 S. Broadway, Crookston, Minn. 1922.
- Lano, Albert, 220 E. Lafayette Ave., Fayetteville, Ark. 1920.
- Lastreto, C. B., 260 California St., San Francisco. 1913.
- Laubenfels, Max Walker de, 620 19th St., Huntington Beach. 1921.
- \*§Law, J. Eugene, Altadena. 1900 (1915).
- \*§Law, Laura Beatty (Mrs. J. E.), Altadena. 1915 (1919).
- Lawrence, Mabel M., 1750½ W. 24th St., Los Angeles. 1921.
- Layne, J. Gregg, 737 S. Spring St., Los Angeles. 1912.
- Leach, Frank A., 217 Hillside Ave., Piedmont. 1917.
- Lee, Mrs. Melicent H., El Cajon. 1920.
- Lee, Ren M., 231 N. C St., Tulare. 1922.
- Leggett, Dr. R. M., 2140 9th Ave., San Francisco. 1918.
- Leland, H. J., 337 Copp Bldg., Los Angeles. 1897.
- Leopold, Aldo, 135 S. 14th St., Albuquerque, N. M. 1916.
- Leopold, Nathan F., Jr., 4754 Greenwood Ave., Chicago, Ill. 1920.
- Libby, Miss Gretchen L., 310 2d Ave., Santa Barbara. 1911.
- Lien, Carl, Clallam Bay, Wash. 1917.
- Ligon, J. Stokley, Box 131, Albuquerque, N. M. 1914.
- Liliencrantz, H. T., Rancho Las Cimas, Hollister. 1916.
- Limbirt, R. W., Box 1284, Boise, Idaho. 1921.
- Lindemann, Miss W. C., 1435 8th St., Alameda. 1922.
- Lindsay, Dr. D. Moore, 808 Boston Bldg., Salt Lake City, Utah. 1915.
- §Little, Luther, 1403 Garfield Ave., S. Pasadena. 1914.
- Littlejohn, Chase, 1226 Warren St., Redwood City. 1901.
- Livesey, Alice Rose, 373 W. California St., Glendale. 1921.
- Lofffield, Gorm, Carnegie Institution, Tucson, Ariz. 1918.
- Lombardi, Mrs. M. E., 2249 Piedmont Ave., Berkeley. 1916.
- Loring, J. Alden, Owego, Tioga Co., N. Y. 1914.
- §Love, Guy, R.D. 1, El Cajon. 1913.
- Lunt, James C., 109 Liberty St., San Francisco. 1922.
- Lusk, Richard D., Winkleman, Ariz. 1915.
- Luther, Clarence H., 8 McIlroy Bldg., Fayetteville, Ark. 1909.
- Lyon, Ray B., Box 186, Paso Robles. 1920.
- MacKaye, David L., Tulare. 1922.
- McAtee, W. L., Biol. Survey, Washington, D. C. 1907.
- McDuff, Esther, 555 Union Ave., San Bernardino. 1919.
- McGettigan, Carroll, 2644 Filbert St., San Francisco. 1921.
- \*McGregor, R. C., Bureau of Science, Manila, P. I. 1893 (1916).
- McGrew, Albert D., 5611 Stanton Ave., Pittsburgh, Pa. 1920.
- McKeough, Dr. Geo. T., Erie Manor, R.D. 1, Blenkerin, Ontario, Canada. 1922.
- McKibben, J. W., 2522 Piedmont Ave., Berkeley. 1921.
- McKinnon, Ross, Blue Rapids, Kas. 1921.
- McLain, R. B., Box 132, Hollywood. 1897.
- McLean, Donald D., 2826 Derby St., Berkeley. 1916.
- McLean, Robert R., 2904 Granada St., San Diego. 1922.
- McLellan, Antonio, 309 San Francisco St., El Paso, Tex. 1920.
- McLellan, Miss Mary E., 2935 Pine St., Berkeley. 1919.
- McMullen, Turner E., 551 Bailey St., Camden, N. J. 1920.
- Magee, William A., Jr., R.D. Fruitvale, Box 433, Oakland. 1912.
- Mailliard, Ernest C., Federal Reserve Bank, San Francisco. 1909.
- Mailliard, John W., 230 California St., San Francisco. 1894.
- \*Mailliard, Joseph, 1815 Vallejo St., San Francisco. 1895 (1920).
- Marshall, Dr. Benj. M., 2036 D St., Eureka. 1913.
- Marshall, Perry R. F., 7213 Sunset Blvd., Los Angeles. 1920.
- Martin, Mrs. Bertha Davis, 1644 Maltman Ave., Los Angeles. 1920.
- Martin, De Loach, 1223 S. Washington Ave., Marshall, Texas. 1916.
- Massey, Herbert, Ivy Lea, Burnage, Didsbury, Manchester, England. 1909.
- Maxson, Asa C., Longmont, Colo. 1920.
- Mead, Mrs. Edwin B., 2618 Etna St., Berkeley. 1920.

- Meade, Mrs. Calvert, Box 161, Carmel. 1916.  
 Meadows, Donald C., 231 N. Grand St., Orange. 1919.  
 Meeker, Jesse C. A., Box 161, Danbury, Conn. 1907.  
 Meister, H. D., Wauseon, Ohio. 1909.  
 \*§Mershon, W. B., Saginaw, Mich. 1911 (1919).  
 Meyers, Harold E., Medina, N. Y. 1920.  
 Michael, Chas. W., Yosemite. 1916.  
 Middleton, R. J., Jeffersonville, Pa. 1918.  
 Millard, F. C., 1424 W. Pine St., Alhambra. 1922.  
 Miller, Mrs. Delphia S., 1523 Tonawanda Ave., Los Angeles. 1921.  
 Miller, Frederic W., 935 S. Gaylord St., Denver, Colo. 1922.  
 Miller, Dr. Loye Holmes, S. Branch, Univ. Calif., Los Angeles. 1905.  
 Miller, Mary Mann, 5928 Hayes Ave., Los Angeles. 1920.  
 Miller, R. C., 2406 Fulton St., Berkeley. 1921.  
 Miller, W. De Witt, Amer. Museum Nat. Hist., New York, N. Y. 1909.  
 §Mills, Enos A., Longs Peak, Estes Park, Colo. 1914.  
 Miner, Dr. H. N., Penryn. 1903.  
 §Mitchell, H. H., Prov. Museum, Normal School, Regina, Sask., Canada. 1915.  
 Mitchell, Dr. Walton I., Paonia, Delta Co., Colo. 1909.  
 Mix, Mrs. Arthur J., 1915 W. 8th St., Los Angeles. 1922.  
 Moffitt, James, 1818 Broadway, San Francisco. 1917.  
 Moore, Miss Nellie, 122 Falcon Ave., Long Beach. 1915.  
 Moore, Raymond W., 755 Emory St., San Jose. 1919.  
 Moore, Robert T., 46 Mansion Ave., Haddonfield, N. J. 1911.  
 Moore, Wm. Warren, 1431 9th St., Eureka. 1921.  
 Moran, R. B., 1318 S. Gramercy Place, Los Angeles. 1897.  
 \*§Morcom, G. Frean, 243 N. Coronado St., Los Angeles. 1904 (1915).  
 More, R. L., Vernon, Texas. 1911.  
 Morley, S. Griswold, 2535 Etna St., Berkeley. 1916.  
 Mullen, James L., 1264 Logan Ave., Salt Lake City, Utah. 1915.  
 Munro, J. A., Okanagan Landing, B. C., Canada. 1914.  
 Murie, Olaus J., 219 7th Ave. S., Moorehead, Minn. 1913.  
 Musgrave, Ethel Weatherford (Mrs. M. F.), Box 765, Phoenix, Ariz. 1921.  
 Myers, Mrs. H. W., 311 N. Ave. 66, Los Angeles. 1912.  
 \*Nace, C. A., 171 W. Santa Clara St., San Jose. 1920 (1920).  
 Nash, Herman W., Box 264, Pueblo, Colo. 1922.  
 Neff, Johnson A., Marionville, Mo. 1920.  
 Neilson, Mrs. Katherine, 1419 Versailles St., Alameda. 1920.  
 Newhall, Mrs. Chas. S., 2629 Piedmont Ave., Berkeley. 1916.  
 Nice, Mrs. Margaret Morse, Norman, Okla. 1921.  
 Nichols, J. T., Amer. Museum Nat. Hist., New York, N. Y. 1909.  
 Nicholson, Donald J., Orlando, Fla. 1911.  
 Nicholson, Gordon, W. 7th St., Ontario. 1919.  
 Nicholson, Helen S., 1420 Grant St., Berkeley. 1921.  
 Niedrach, Robert J., 30 Pennsylvania St., Denver, Colo. 1922.  
 Nienburg, Miss Matilda V., 2031 Alameda Ave., Alameda. 1922.  
 Noack, H. R., 309 Perry St., Oakland. 1901.  
 Nokes, Dr. I. D., 1120 Marsh-Strong Bldg., Los Angeles. 1914.  
 Norris, Joseph Parker, Jr., 2122 Pine St., Philadelphia, Pa. 1911.  
 Norris, Roy, 725 N. 10th St., Richmond, Ind. 1911.  
 Norton, Arthur H., 22 Elm St., Portland, Me. 1918.  
 Oberholser, Dr. Harry C., 2805 18th St., N. W., Washington, D. C. 1904.  
 O'Farrell, Mrs. Mabel E., 2403 F St., San Diego. 1917.  
 Ohl, H. C., McKittrick. 1913.  
 Ohlendorf, W. C., 320 E. Stewart Ave., Park Ridge, Ill. 1910.  
 Osgood, Dr. Wilfred H., Field Museum Nat. Hist., Chicago, Ill. 1893.  
 Osincup, Clayton A., 30 W. Montana St., Pasadena. 1922.  
 Osterhout, Geo. E., Windsor, Colo. 1915.  
 Overholtzer, John E., 6 W. Main St., Morristown, Pa. 1920.  
 Overington, R. Bruce, 220 Golden Gate, San Francisco. 1920.  
 Owen, Virgil W., 832 Beacon St., Los Angeles. 1896.  
 Palmer, Miss Elizabeth Day, 1741 Harvard Blvd., Los Angeles. 1909.  
 Palmer, R. H., Instituto Geologico, Mexico City, Mex. 1915.  
 \*Palmer, Dr. T. S., 1939 Biltmore St., N. W., Washington, D. C. 1903 (1920).  
 Pangburn, Clifford H., 299 Madison Ave., New York City, N. Y. 1920.  
 Parcell, Miss Zulema L., 1500 W. 9th St., Los Angeles. 1919.

- Parker, Herbert, South Lancaster, Mass. 1911.
- Parmenter, Henry E., 526 E. Valerio St., Santa Barbara. 1916.
- Paroni, Clelia A., 2430 Bancroft Way, Berkeley. 1920.
- Patterson, J. E., Box 478, Ashland, Ore. 1922.
- Paul, J. H., 1320 E. 2d St. S., Salt Lake City, Utah. 1915.
- Paul, Lucius H., 436 Carter St., Rochester, N. Y. 1911.
- Paulson, Martin C., R.D. 5, Nevada, Ia. 1922.
- Peabody, Rev. P. B., Blue Rapids, Kan. 1904.
- Pearson, T. Gilbert, 1974 Broadway, New York, N. Y. 1910.
- Peck, Morton E., 244 N. 12th St., Salem, Ore. 1909.
- Pemberton, J. R., Box 1112, Tulsa, Okla. 1900.
- Pennock, Chas. J., Kennett Square, Philadelphia, Pa. 1909.
- Peyton, Lawrence, R.D. 2, Fillmore. 1909.
- Peyton, Sidney B., Sespe. 1913.
- Phelps, Frank M., 212 E. 4th St., Elyria, Ohio. 1912.
- \*§Philipp, Philip Bernard, 220 Broadway, New York, N. Y. 1911 (1920).
- Phillips, C. L., 5 W. Weir St., Taunton, Mass. 1915.
- §Phillips, John C., Knobfields, Wenham, Mass. 1911.
- \*Pierce, Wright M., Box 116, Claremont. 1902 (1919).
- Pierpont, Philip, Nordhoff. 1913.
- Pilsbury, Frank O., 1088 Main St., Walpole, Mass. 1911.
- Pitcher, Mrs. E. C., R.D. I, Box 273, Hayward. 1920.
- Pope, E. F., Box 113, El Reno, Okla. 1913.
- Potter, Miss Carolyn B., 1314 Alice St., Oakland. 1920.
- Potter, Miss Jessica A., 1118 Santee St., Los Angeles. 1922.
- Powell, Miss Helen, 2703 Dwight Way, Berkeley. 1914.
- Pratt, Helen S., 245 W. Ridgway, Eagle Rock. 1920.
- Price, A. E., Grant Park, Ill. 1905.
- Prill, Dr. A. G., Scio, Ore. 1921.
- \*Pringle, Miss Cornelia Covington, 1705 Gough St., San Francisco. 1915.
- Procter, James Norris, Box 188, Santa Paula. 1922.
- Purdy, William B., Milford, Mich. 1921.
- Quillin, Roy W., 1025 Summit Ave., San Antonio, Texas. 1921.
- Racey, Kenneth, 3262 1st Ave. W., Vancouver, B. C. 1921.
- Raker, Mary E., 1484 E. Sherman St., Portland, Ore. 1919.
- Rand, F. L., 1108 Arcade Bldg., St. Louis, Mo. 1921.
- Randolph, Miss Flora A., 2962 Derby St., Berkeley. 1907.
- Rankin, Edward P., 2410B Bancroft Way, Berkeley. 1913.
- Ransom, Webster H., 708 W. 20th Ave., Spokane, Wash. 1921.
- Rathbun, S. F., 217 14th Ave. N., Seattle, Wash. 1904.
- Rawson, Charles I., Oxford, Mass. 1918.
- Ray, Milton S., 29 Spear St., San Francisco. 1899.
- Raymond, Mrs. C. E., 21 3d St., Hinsdale, Ill. 1921.
- Reichenberger, Mrs. E. M. B., Amer. Museum Nat Hist., New York City, N. Y. 1922.
- Reid, Russell, 208 3d St., Bismark, N. Dak. 1921.
- Reis, C. O., 116 Diamond St., Redondo Beach. 1917.
- Rett, Egmont J., 3060 Larimer St., Denver, Colo. 1922.
- Reygadas, Ynez Mexia de, 401 Medical Bldg., San Francisco. 1921.
- Reynolds, L. R., 124 Park St., Brockton, Mass. 1913.
- Rich, Dr. Guy C., 1820 El Cerrito Place, Hollywood. 1911.
- Rich, Selwyn, Box 55, Claremont. 1919.
- Rich, Waldo L., Saratoga Springs, N. Y. 1919.
- Richards, E. B., 128 Chester St., Grass Valley. 1909.
- Richards, Dr. T. W., Naval Hospital, Annapolis, Md. 1908.
- Richards, W. W., 1512 Broadway, Oakland. 1915.
- Richardson, W. D., 4215 Prairie Ave., Chicago, Ill. 1918.
- Richey, J. Howard, 261 W. Dakota St., Pasadena. 1914.
- Richmond, Dr. Chas. W., U. S. Nat. Museum, Washington, D. C. 1904.
- Richmond, Frank, care Richmond Bros., El Centro. 1920.
- Rigdon, Dr. R. L., 1617 Broderick St., San Francisco. 1921.
- Riley, J. H., U. S. Nat. Museum, Washington, D. C. 1909.
- Rittenhouse, Prof. Samuel, Univ. S. Cal., Los Angeles. 1916.
- Ritter, Prof. W. E., LaJolla. 1901.
- Robbins, Reginald C., North-east Harbor, Maine. 1921.
- Roberts, Dr. T. S., Zoological Museum, Univ. Minn., Minneapolis, Minn. 1909.



- Robertson, Howard, 157 Wilton Drive, Los Angeles. 1896.
- §Robertson, John McB., R.D. 1, Box 13, Buena Park, Orange Co. 1913.
- Robertson, Mrs. John McB., Buena Park. 1920.
- Roe, Mrs. E. D., 225 Cumberland St., San Francisco. 1919.
- Ross, Ronald C., 388 Dearborn St., Pasadena. 1920.
- Rowan, Wm., Dept. Zool., Univ. Alberta, Edmonton, Alta., Canada. 1921.
- Rowley, J., 403 S. 1st St., Alhambra. 1909.
- Rush, Lora Gertrude, 1607 Walnut St., Berkeley. 1920.
- Rust, Henry J., Box 683, Coeur d'Alene, Idaho. 1911.
- Sage, Jno. H., Portland, Conn. 1910.
- Sampson, W. B., 1005 N. San Joaquin St., Stockton. 1894.
- Sanderson, Miss Dorothy, 1217 McCadden Pl., Los Angeles. 1922.
- Sanford, Dr. Leonard C., 347 Temple St., New Haven, Conn. 1915.
- Sanford, W. H., 919 W. Acacia St., Stockton. 1915.
- Sapp, Charles, 544 Markwell Bldg., Long Beach. 1922.
- Saunders, Aretas A., 48 Longview Ave., Fairfield, Conn. 1909.
- Saunders, Mrs. Kenneth, Creston Road, High Acres. 1920.
- Saunders, W. E., London, Ont., Canada. 1910.
- Saville, Miss Elsie M., 403 E. 8th St., Topeka, Kan. 1920.
- Schaefer, Oscar F., 669 Genesee St., Rochester, N. Y. 1917.
- Schleichert, Ernest K., Mathias Point, Va. 1919.
- Schlesinger, Mrs. Jane L., 1417 Filbert St., Oakland. 1915.
- Schneider, Fred A., care Warren Dried Fruit Co., San Jose. 1901.
- Schneider, Mrs. G. H., 4618 Kingswell Ave., Los Angeles. 1921.
- §Schneider, J. J., Box 363, Anaheim. 1899.
- Schussler, Geo. W., 1345 Oak St., San Francisco. 1911.
- Slater, William Lutley, 10 Sloane Court, London, S. W., England. 1909.
- Scott, Carroll DeWilton, 1620 7th St., San Diego. 1915.
- Sharp, Clarence S., Escondido. 1902.
- Sharples, Robert P., West Chester, Pa. 1911.
- Shaw, Prof. W. T., 1000 Thatuna St., Pullman, Wash. 1911.
- Sheldon, Harry H., care Commercial Tr. & Svgs. Bank, Santa Barbara. 1922.
- Shelton, Alfred C., Johnston-Shelton Co., Dayton, Ohio. 1909.
- Shepard, John Alden, Route A, Morgan Hill. 1919.
- Shepherd, A. R., 457 W. Burchett St., Glendale. 1920.
- Shepherd, Hattie E., R.D. 1, Box 73, Redlands. 1920.
- \*Sherman, Althea R., National, via McGregor, Iowa. 1911 (1916).
- Shinn, Mrs. Dora H., 433 Griffith Ave., San Mateo. 1921.
- Shiras, George, 3d, Stoneleigh Court, Washington, D. C. 1914.
- Shupee, George C., Box 964, San Antonio, Texas. 1920.
- Silliman, Edmund, Alisal and Ryker Sts., Salinas. 1918.
- Silliman, O. P., 220 Salinas St., Salinas. 1913.
- Simmons, George F., 701 Holman Ave., Houston, Texas. 1913.
- Simonds, Dr. Paul E., 304 Loring Bldg., Riverside. 1922.
- Sismey, E. D., Box 222, Penticton, B. C., Canada. 1919.
- \*Skinner, M. P., Yellowstone Park, Wyo. 1915 (1920).
- Sloanaker, Jos. L., 907 W. Mansfield Ave., Spokane, Wash. 1910.
- Smith, Allyn G., 1721 Madera St., Berkeley. 1909.
- Smith, Austin Paul, Apartado 412, San Jose, Costa Rica. 1907.
- Smith, A. Russell, Mt. Carmel Ave., North Glenside, Penn. 1919.
- Smith, C. R., 563 42d Ave., San Francisco. 1917.
- Smith, Prof. Frank, 1005 W. California Ave., Urbana, Ill. 1911.
- Smith, Franklin J., Box 98, Eureka. 1913.
- Smith, Horace G., 2918 Lafayette St., Denver, Colo. 1914.
- Smith, Napier, care Bank of Montreal, Magog, Quebec. 1919.
- Smyth, Mrs. W. H., Fernwald, head of Dwight Way, Berkeley. 1918.
- Snyder, Prof. J. O., Box 775, Stanford University. 1900.
- Spaulding, M. Herrick, Agr. Coll., Bozeman, Mont. 1918.
- Springer, Charles, Cimarron, N. Mex. 1920.
- Stacey, John William, 634 Powell St., San Francisco. 1920.
- Stafford, Walter A., 31 Park Way, Piedmont. 1917.
- Stanford, Miss Mabel A., Box 124, Claremont. 1921.
- Steilberg, Mrs. E. Van E., 1 Panoramic Way, Berkeley. 1918.

- Steinbeck, William, 1029 N. Hunter St., Stockton. 1897.
- Stephens, T. C., Morningside College, Sioux City, Iowa. 1914.
- Stephenson, Miss Omie, Monte Vista, Colo. 1922.
- Still, Donald, 63371 Tyndall Ave., Tucson, Ariz. 1918.
- Stivers, Dr. C. G., 406 Auditorium Bldg., Los Angeles. 1914.
- Stoddard, H. L., Public Museum, Milwaukee, Wis. 1914.
- Stone, D. D., R.D. 3, Oswego, N. Y. 1909.
- Stone, Geo. E., 1725 Le Roy Ave., Berkeley. 1912.
- Stoner, Emerson A., Box 444, Benicia. 1918.
- Storer, Miss Mary S., 467 San Pablo Ave., Fresno. 1914.
- Storer, Tracy I., Museum Vert. Zool., Berkeley. 1910.
- Stormont, W. P., 219 W. Ave. 51, Los Angeles. 1917.
- Stow, Harry P., 1617 Central Ave., Alameda. 1921.
- Strauss, Alex., Banning. 1922.
- Streator, Clark P., 16 Mason St., Santa Cruz. 1919.
- \*§Strong, W. A., 41 Grand Ave., San Jose. 1912 (1920).
- Strong, Wm. Duncan, 2522 Ridge Road, Berkeley. 1921.
- Stuart, Geo. H., 3d, 923 Clinton St., Philadelphia, Pa. 1913.
- Sugden, J. W., 47 S. 8th W. St., Salt Lake City, Utah. 1915.
- Suits, Clarence L., 149 Fairmont Ave., Eagle Rock. 1920.
- Swales, B. H., U. S. Nat. Museum, Washington, D. C. 1906.
- Swarth, Harry S., Museum Vert. Zool., Berkeley. 1897.
- Sweeney, Joseph A., U. S. Forest Service, Nenzel, Neb. 1912.
- Swenk, Prof. Myron Harmon, 1410 N. 37th St., Lincoln, Neb. 1916.
- Swezy, Dr. Olive, Zool. Dept., Univ. Cal., Berkeley. 1914.
- Tanner, V. M., Dixie Normal Coll., St. George, Utah. 1919.
- Taverner, P. A., Zool. Div., Geol. Survey, Ottawa, Ont., Canada. 1909.
- Taylor, E. F., Grass Valley, Nevada Co. 1910.
- Taylor, Mrs. H. J., 1711 Douglas St., Sioux City, Iowa. 1920.
- Taylor, Jesse H., 210 Myrtle Ave., Eagle Rock. 1919.
- Taylor, L. E., R.D. 2, Reno, Nev. 1897.
- Taylor, Lionel V., Kelowna, B. C., Canada. 1921.
- Taylor, Dr. Walter P., Biol. Sta., La Jolla. 1905.
- Teachenor, Dix., 510 Rialto Bldg., Kansas City, Mo. 1922.
- Tenney, Vernon L., 2536 Etna St., Berkeley. 1922.
- Terrill, L. McI., 44 Stanley Ave., St. Lambert, Que., Canada. 1911.
- Terry, Mrs. Anne B., 1976 N. Berendo St., Hollywood. 1920.
- Test, Dr. Louis A., 222 North St., W. Lafayette, Ind. 1908.
- \*§Thayer, John E., Box 98, Lancaster, Mass. 1906 (1914).
- Thomas, Geo. C. 3rd, 1014 Crescent Drive, Beverly Hills. 1922.
- Thompson, Mrs. H. F., 817 S. Spring St., Los Angeles. 1922.
- Thompson, J. Walcott, 527 E. 1st S. St., Salt Lake City, Utah. 1918.
- Thomson, Miss Isabel A., 5939 Shafter Ave., Oakland. 1918.
- Thowless, Herbert L., 255 Fourth St., Newark, N. J. 1919.
- Tindall, Charles W., 912 N. Noland St., Independence, Mo. 1920.
- Todd, W. E. Clyde, Carnegie Museum, Pittsburgh, Pa. 1909.
- Tonkin, George, Biol. Survey, Baker, Ore. 1920.
- Torrey, Frederic C., 1 Canyon Road, Berkeley. 1921.
- Treganza, A. O., 522 S. 13th St. E., Salt Lake City, Utah. 1907.
- Treganza, Mrs. A. O., 522 S. 13th St. E., Salt Lake City, Utah. 1915.
- Trenor, T., Box 2, Sta C., Los Angeles. 1913.
- Trescot, E. B., R.D. 4, Box 221, Petaluma. 1915.
- Trippie, Thomas M., Howardsville, Colo. 1911.
- Trumbull, J. H., 39 Farmington Ave., Plainville, Conn. 1911.
- \*Tyler, John G., P. O. Box 173, Fresno. 1905 (1920).
- Tyler, Dr. Winsor M., 522 Massachusetts Ave., Lexington, Mass. 1914.
- Ufford E'mer, Box 92, Dresden, Kan. 1917.
- Unglish, W. E., Gilroy. 1910.
- Van Cleve, H. R., 539 Mer. Nat. Bank Bldg., Los Angeles. 1922.
- Van Denburgh, Dr. John, 240 Stockton St., San Francisco. 1916.
- Van Dyke, Mary Ames, 1545 Le Roy Ave., Berkeley. 1920.
- Van Fleet, Clark C., Box 468, Santa Rosa, 1906.
- Van Gaasbeek, Miss Florence M., 2523 Hille-gass Ave., Berkeley. 1921.

- §Van Rossem, Adriaan, 3459 S. Arlington St., Los Angeles. 1909.
- \*Van Straaten, H., Het Veldhuis, 8 Dennerweg, Velp, Holland. 1918 (1919).
- Vorhies, Chas. T., Univ. Ariz., Tucson, Ariz. 1916.
- Wachtel, Elmer, Box 103A, 1155 Linda St., Pasadena. 1922.
- Wade, Otis H., 1353 Vine St., Hollywood. 1921.
- Wagner, Edward H., 527 San Joaquin St., Stockton. 1922.
- Walker, Alex., Blaine, Ore. 1911.
- Walker, Ernest P., Biol. Survey, Juneau, Alaska. 1910.
- Wanzer, James Olin, Cal. Highway Comm., Div. 3, Sacramento. 1921.
- Warburton, Stanton, Jr., 311 Fidelity Bldg., Tacoma, Wash. 1917.
- Ward, F. H., 18 Grove Place, Rochester, N. Y. 1915.
- Warmer, Charles A., 1310 Baker-Detwiler Bldg., Los Angeles. 1920.
- Warmer, Mrs. Edna R., 2549 Beechwood Drive, Los Angeles. 1921.
- Warren, E. R., 1511 Wood Ave., Colorado Springs, Colo. 1909.
- Waterhouse, John Thomas, care Alexander and Baldwin, Ltd., Honolulu, T. H. 1921.
- Wear, Miss Winifred N., 253 Coast Ave., Fresno. 1909.
- Weber, J. A., Moore and Grand Aves., Leona, N. J. 1915.
- Wegeforth, Dr. Harry M., 210 Maple St., San Diego. 1920.
- Weiser, Charles S., 105 W. Springettsbury Ave., York, Penn. 1920.
- Welch, L. W., 1845 Olive Ave., Long Beach. 1911.
- Welsh, Joseph, Pasadena Hdw. Co., Pasadena. 1917.
- Wetmore, Dr. Alexander, Biol. Survey, Washington, D. C. 1909.
- Whalen, Mrs. Etta L., Box 128, Williams, Minn. 1914.
- Wheeler, Mrs. J. W., 403 15th Ave. N., Seattle, Wash. 1912.
- Wheeler, Roswell S., 1221 Boston St., Altadena. 1894.
- White, Halsted G., 1437A Walnut St., Berkeley. 1914.
- Whitney, Miss Margaret W., 1563 N. Raymond Ave., Pasadena. 1919.
- Whittle, Charles L., 50 Congress St., Boston, Mass. 1922.
- Widmann, O., 5105 Enright Ave., St. Louis, Mo. 1904.
- Wilcox, Mrs. Lydia, 10 Latona St., San Francisco. 1921.
- Wilder, H. E., Carlotta, Humboldt Co. 1909.
- Willard, B. G., 51 Fresh Pond Parkway, Cambridge, Mass. 1910.
- Willard, F. C., Farmingdale, Long Island, N. Y. 1905.
- Willett, Geo., Craig, Alaska. 1905.
- Williams, John, R.D. 9, Iowa City, Iowa. 1918.
- Williams, R. F., 218 Inwood Ave., Upper Montclair, N. J. 1919.
- Williams, Ralph B., San Ysidro Ranch, Santa Barbara. 1922.
- Williams, Robert W., Tallahassee, Fla. 1914.
- Wilson, Rev. Francis M., Beaumont. 1921.
- Wilson, J. Frank, 512 E. Lemon St., Monrovia. 1915.
- Winson, J. W., Huntingdon, B. C., Canada. 1921.
- Wolfe, Lieut. L. R., 64th U. S. Inf., Plattsburg Barracks, N. Y. 1921.
- Wonser, Mrs. Katherine A., 4102 Brooklyn Ave., Seattle, Wash. 1920.
- Wood, Dr. Casey A., 7 West Madison St., Chicago, Ill. 1916.
- Wood, Dale T., 1470 E. Wilson Ave., Glendale. 1921.
- Wood, Jesse J., 330 W. Micheltoreno St., Santa Barbara. 1912.
- Wood, Mrs. Mildred Tiffany, Hopland. 1921.
- Wood, Norman A., Museum Zool., Ann Arbor, Mich. 1916.
- Woodruff, Frank M., Chicago Acad. Sciences, Chicago, Ill. 1906.
- Woodruff, Regina, Zool. Dept., Univ. Calif., Berkeley. 1920.
- Woods, Robert S., 919 S. Bonnie Brae, Los Angeles. 1920.
- Woodward, C. H., 4129 Ingalls St., San Diego. 1920.
- Wright, Curtis, 81 Hillcrest, Berkeley. 1916.
- §Wright, Frank S., 14 Cayuga St., Auburn, N. Y. 1910.
- Wright, Howard W., 830 N. Orange Grove Ave., Pasadena. 1921.
- Wueste, Rudolph, Lower Otay Dam, Bonita. 1901.
- \*Wyman, L. E., Museum Hist., Sci., and Art, Los Angeles. 1908 (1920).
- Wythe, Margaret W., Museum Vert. Zool., Berkeley. 1912.
- Young, Pauline Rodgers, Canille, Santa Cruz Co., Ariz. 1918.
- Zahn, Otto J., 2115 Estrella Ave., Los Angeles. 1896.
- Zech, Miss Lillian, 335 W. Highland Ave., Redlands. 1916.
- Zerlang, John, Rolph, Humboldt Co. 1918.
- Zerlang, Lawrence, 524 W. Hawthorne St., Eureka. 1918.
- Zinn, Zola, 4002 39th St. S. W., Seattle, Wash. 1921.

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# THE CONDOR

A Magazine of Western  
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Volume XXIV

September-October, 1922

Number 5



COOPER ORNITHOLOGICAL CLUB

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# THE CONDOR

A Magazine of Western Ornithology  
Published Bi-Monthly by the Cooper Ornithological Club

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Entered as second-class matter January 25, 1922, at the post-office at Pasadena, California, under Act of Congress of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized January 5, 1921.

Issued from the Office of THE CONDOR, 770 South Pasadena Avenue, Pasadena, California

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*Issued September 22, 1922*

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# THE CONDOR

## A Bi-Monthly Magazine of Western Ornithology

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Volume XXIV

September-October, 1922

Number 5

[Issued September 22, 1922]

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### THE MIMETIC ASPECT OF THE MOCKER'S SONG

By DONALD R. DICKEY

WITH FOUR PHOTOGRAPHS BY THE AUTHOR

**O**BSERVATION of the tender age at which mockingbirds (*Mimus polyglottos*) attain a varied and "imitative" song has led the author into a train of thought and to a tentative hypothesis that falls admittedly in the class of sheer speculation. As such, however, it has interested me, and a brief note in that connection is therefore submitted to CONDOR readers. Its intent is purely suggestive. If it serves no other purpose, it may help to check the loose finality with which the mimetic character of this bird's song is popularly ascribed to pure and simple mockery. If the anthropomorphic attitude is steadfastly set aside, there remains a serious doubt in my mind as to whether this loose, popular acceptance is scientifically tenable.

On October 14, 1921, A. J. van Rossem collected an immature male Western Mockingbird which had just completed the post-juvenal moult (no. J 1452, collection of Donald R. Dickey). When taken, it was successfully "imitating" the notes of the Sparrow Hawk, Killdeer, and Cactus Wren. The rendition of these calls, together with the more characteristic mockingbird interludes, was so fluent and skillful as to convince the listener that he was hearing an old performer. The very few months which had actually elapsed since this youngster first saw light would seem to form all too short a period for the purely imitative acquisition of so varied a repertoire. May not generations of usage have made this ability an inherent rather than a mimetic characteristic?

Disregard for a moment the original manner in which the vocal versatility of the species was evolved, for in any event that is lost to us in the unrecorded past. Is it folly to suggest that the "imitative" portion of this particular individual's repertoire was as inherent and hereditary in his breast as were the true mockingbird phrases? There is a strong suspicion in my mind that if this bird had been transplanted as a nestling to a favorable habitat on which the note of Sparrow Hawk, or Killdeer, or Cactus Wren, had never fallen, he would yet have greeted approaching maturity with "imitations" of their songs. In other words, may this not be a case of parallel ability and adventitious similarity rather than actual and individual mimicry?

"But," observers will say, "we have actually heard the cries of unrelated species taken up and repeated by mockingbirds!" True, but is this not

the result of stimulus rather than tutelage,—induced parallelism, rather than true mimesis? We have all heard bird notes that resembled those of insects which were vocal at the same time and place, but we do not suggest that one learned from the other! The sound of the rattlesnake has no connection with

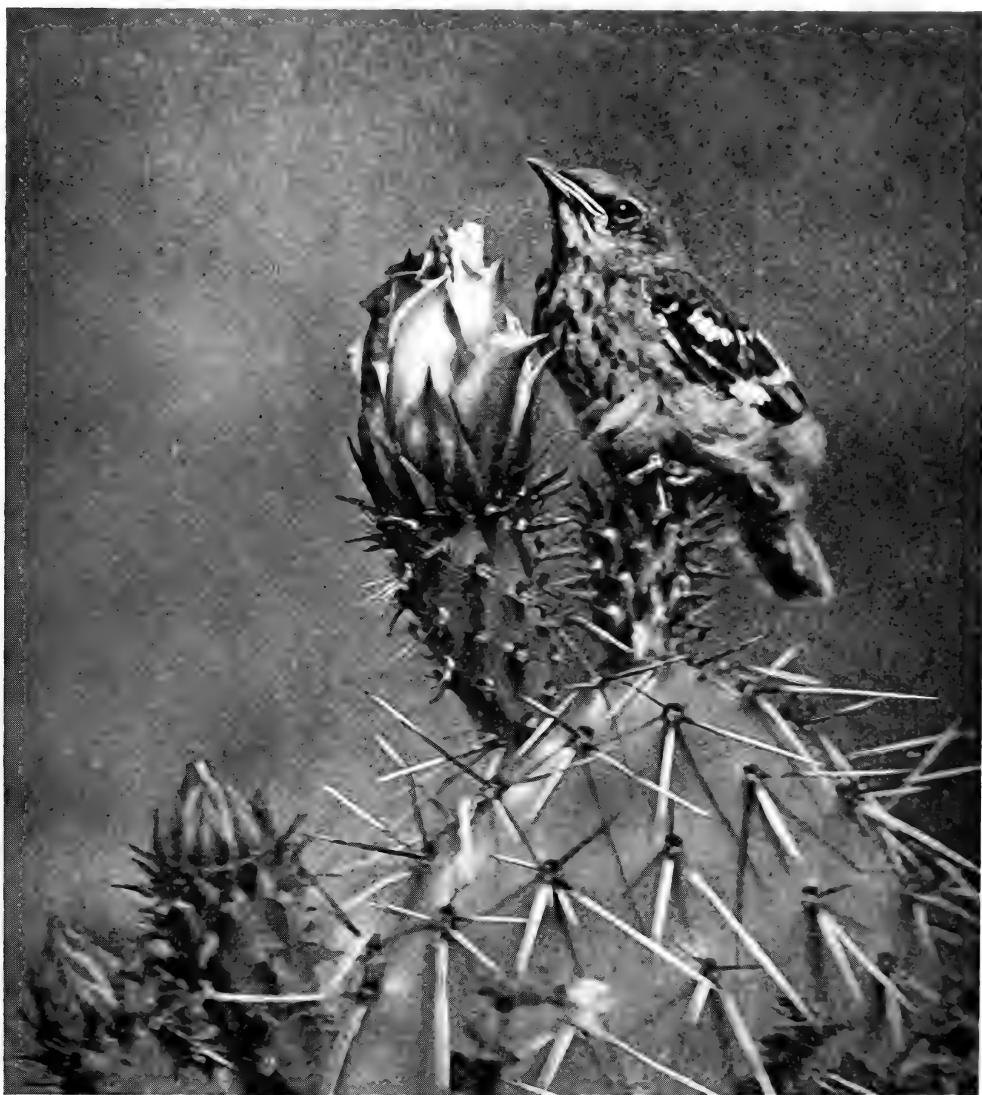


Fig. 35. NESTLING MOCKER; SAN CLEMENTE ISLAND.

that of the "rattle-weed" save in similarity, and sometimes fortuitous propinquity. Admit that the insect vocalization *might* activate the Grasshopper Sparrow, the weed *might* activate the rattler,—then, by the same token, the Killdeer *might* activate, but not teach, the mockingbird. We have all seen a frisky calf set a sedate plow horse to gamboling in the same pasture, yet no



Fig. 36. THE MOCKER'S SONG.

one would suggest that old Dobbin had *learned* his sportive capers from the newborn calf. The latter furnishes a stimulus to similar activity, and nothing more.



Fig. 37. THE WESTERN MOCKINGBIRD; SAN CLEMENTE ISLAND.

Experience with cage birds may be urged against this perhaps fanciful hypothesis, for "teachers" are employed, I believe, to develop the maximum purity of tone and variety of song in "roller" canaries. But, is not this purely for the purpose of attaining ultra-refinement? Every child has an inherent

capacity for running and jumping of a very creditable sort, yet a pacemaker is necessary to develop a winning athlete in an Olympic track meet. In summing up, then, no claim is made that the perfection of a mocker's so-called "imitation" is attained without examples to copy—without oral assistance—but the suggestion is made that the basic phrases of a mockingbird's vocabu-



Fig. 38. NEST OF THE WESTERN MOCKER, IN TUNIS CACTUS.

lary which simulate the notes of other birds may well be as intrinsic a part of his transmitted vocal ability as are those other interludes which have no analogies among other species.

*Pasadena, California, June 7, 1922.*

## OUR ENGLISH NOMENCLATURE\*

By A. D. DUBOIS

FOR MANY years after subspecies began to be recognized, ornithologists gave names to all the races of a species except one; that one race was designated by the name of the species only. For example, a little more than a decade ago, *Sialia sialis* was a species of which two races were recognized, one of which was called *azurea*; the other race was nameless. We now call that nameless race, *sialis*. It is a mere repetition of the specific name, to be sure, but much better than no designation at all. In the meantime *azurea* has been changed to something else, but we nevertheless now have two subspecific Latin names for the two races of *Sialia sialis*.

In our system of English names we are not so fortunate. Bluebird, presumably, is a generic term; it is our English name for the genus, *Sialia*. How then, in view of our several North American species of this genus, can we be justified in designating one species, much less a single subspecies, as *the* Bluebird?

Of our three North American species of Bluebirds only one (the Mountain Bluebird) has been given an English name. The Mexican Bluebird (*Sialia mexicana*) has three races within our limits, with the subspecific names, Western, Chestnut-backed, and San Pedro, respectively, but no English name appears in the list to represent the species. The American Bluebird (*Sialia sialis*) exhibits a yet more remarkable combination. It has two races, one of which is called merely "Bluebird." The other race of this species has the race name, Azure. The *species* has no English name whatever.

We have no reason to fear the effect of a touch of science applied to the vulgar terminology. It should be not so much a "vernacular" system as a pure, scientific English system. A trinomial such as "Eastern American Bluebird" would impose no new weight of responsibility upon the barefoot lad who loves all Bluebirds and knows but one variety. Neither need the ornithologist feel constrained to announce to his neighbor, on the first bright day of spring, that the "Chestnut-backed Mexican Bluebird" has arrived; any more than he need tell him that his brother, "James Montgomery Birdcraft", is authority for the observation. "The bluebirds are back; Jim saw one this morning", would convey the information between neighbors quite as fully as it does at present.

As given in the current check-list, the name of the type-race of each subdivided species is usually the specific name, though frequently a subspecific term. In many cases a subspecific name has been coupled with the generic name only, as previously pointed out in the case of the Bluebird. This practice is very confusing to the student, especially to the beginner, who speaks and thinks of birds in terms of English names. As a further example, consider the Downy Woodpecker. This is a definite English name for the species *Dryobates pubescens*. There are several races. One of them (*medianus*) is called the Northern Downy Woodpecker; another (*nelsoni*), is the Alaskan Downy Woodpecker. These names are both logical and appropriate. But the names Willow Woodpecker and Batchelder's Woodpecker, other races of the

\*A paper presented at the thirty-ninth Meeting of the American Ornithologists' Union at Philadelphia, November 9, 1921.

same species, contain no hint that the species referred to is the familiar Downy Woodpecker. Of the common American Robin we have three geographical races: one is called Western, another Southern, but the remaining race has no name. In the groups of Downy and Hairy Woodpeckers the length of the trinomial cannot be consistently urged as an objection, since we already have the Rocky Mountain Hairy Woodpecker.

Many of the specific designations which were contained in the old A. O. U. check-list, but which were dropped in the third edition, might very well be revived. Notable among these was the prefix, American, as applied to such species as the following:

129 Merganser	364 Osprey
160 Eider	475 Magpie
163 Scoter	486 Raven
182 Flamingo	488 Crow
196 Egret	521 Crossbill
221 Coot	529 Goldfinch
225 Avocet	697 Pipit
228 Woodcock	761 Robin

In the case of the Long-eared Owl it was consistent to drop the prefix, American, because it was superfluous and had the effect of producing a trinomial, which was applied to a species. In the common nomenclature, as in the scientific, binomials should be adequate for species. By analogy, it is doubted that "Merganser" is a sufficient replacement for "American Merganser". In connection with this prefix, "American", it is well to consider whether the same English name should apply in all English-speaking countries. The terms American, European, etc., have been used both for species and races. In the case of the White-fronted Goose, if we are to have an "European" subspecies, we ought to have an "American" subspecies also. As examples of other species which are in need of "more" name, the following will occur to everyone:

444 Kingbird	587 Towhee
456 Phoebe	735 Chickadee
501 Meadowlark	766 Bluebird

While the above are all generic names, bereft of their rightful specific designations, there is another common form of abbreviation which neglects the generic term entirely. For example, among the ducks we have the following:

Mallard	Redhead
Gadwall	Canvas-back
Baldpate	Golden-eye
Shoveller	Buffle-head
Pintail	Old-squaw

Such abbreviations as these are very appropriately used by sportsmen. They are natural and sufficient in ordinary conversation and appropriate in literature. Such usage, however, does not justify them in the formal A. O. U. list. The word, Duck, should appear after each of them. We have also the Sora (Rail), Knot (Sandpiper), Killdeer (Plover), Ferruginous Rough-leg (Hawk), Flicker (Woodpecker) and others, in the same category. It is common custom among ornithologists and nature-lovers generally to use the term "Red-wing" as an informal abbreviation of Red-winged Blackbird. The naturalists have a right to their spontaneous informalities as well as the sportsmen!—but



I think they should not be adopted in the scientific list. No species can be adequately named by a single term.

With reference to the kinds of terms that are applicable, it may be said in general that descriptive names seem more appropriate for species, since species are based on distinct characters, while locality names or the names of persons are better suited to subspecies, which are geographically variable and as a rule only slightly differentiated in characteristics. Such terms as Eastern, Western, Northern, Southern, seem eminently suitable for the designation of races, but should be avoided as far as possible for the naming of species. It would probably not be advisable to revise any existing names to comply with such usage, except in cases where an earlier name had been abandoned and could be revived without confusion. I think, for example, that "Louisiana Tanager" was a better name than "Western Tanager". The older name was geographically appropriate, had a historical background, and possessed a certain "color" or euphony, which suited the subject much better than the bald term, "Western". Furthermore, it was in use for years, and is still used in thought if not in print.

Personally, I think that the possessive form is appropriate for subspecific names but not for the names of species. If this were adopted as a rule of nomenclature it would preclude such awkward combinations as Vigors's Bewick's Wren, Anthony's Hutton's Vireo or Frazar's Hutton's Vireo; these would become Vigors' Bewick Wren, Anthony's Hutton Vireo and Frazar's Hutton Vireo.

No matter how "popular" a *false* name may be among laymen, it should not be recognized by a body of scientific men, whose endeavors are presumably directed toward education of the public. A Sandpiper should not be called a "Plover"; neither should an Anhinga be recognized throughout the English-speaking world as a "Turkey"! Even "Nighthawk" is a rather unfortunate misnomer. Probably most of us have been asked if the Nighthawk catches chickens.

Of greater importance than the selection of the most appropriate English names, is the logical presentation of them in the system of classification. At present the species and subspecies in the abridged edition of the A. O. U. checklist are "all in a jumble". Those species which have no racial subdivisions are represented in the Latin nomenclature by a binomial, so that their status is perfectly clear. But each species which is subdivided is represented by the trinomial of one of its races instead of the binomial of the species in general, while the number used therewith is the number of the species in general (without the suffix of a race). The Snow Goose will serve to illustrate. It appeared in the former list as follows:

- 169 *Chen hyperborea*  
Lesser Snow Goose
- 169a *Chen hyperborea nivalis*  
Greater Snow Goose

Here we have the two races of the Snow Goose nicely differentiated by English names, of ideal construction; but the first race has only the general number and the Latin binomial of a species.

In the third edition of the list we find it appearing thus:

- 169 *Chen hyperboreus hyperboreus*  
Snow Goose
- 169a *Chen hyperboreus nivalis*  
Greater Snow Goose

Thus we have given the first race a Latin name but have taken away its English sub-specific name, leaving only the common name of the species in general. Would it not be far better that the species and its races should appear as follows:

- 169 *Chen hyperboreus*  
     Snow Goose  
     169z *Chen hyperboreus hyperboreus*  
         Lesser Snow Goose  
     169a *Chen hyperboreus nivalis*  
         Greater Snow Goose

Each species, regardless of its subdivisions or the absence of them, would then have its permanent number, as at present, and would be distinctly represented by its binomial, apart from all subspecies. The Latin binomial should be accompanied by a corresponding English name to designate the *species*. Unmistakable English names for the groups that we call species will become even more essential as our evolution specialists discover and give names to more and more races. For certain purposes the whole subject of subspecies may properly be ignored, and in such circumstances the user of the list of birds, especially the user of the abridged list, desires a clear, outstanding nomenclature of species, in which all references to subspecies are relegated to their proper subordinate place.

Inasmuch as each species has its permanent number, it is equally important that *every* subspecies shall have a designating letter. As previously pointed out, one of the races of every species is without any designation of this kind in the present check-list. This race could be given the letter "z" and no changes whatever would be necessary in the numbers and letters now existing. If we let it be understood that the first-described race of each species will be designated by the last letter of the alphabet, while the subsequently discovered races will be represented by the first letters of the alphabet, the matter will be clear to every one.

In order to carry out this plan it is suggested that the abridged check-list, as well as the unabridged, be printed in such form that the species will stand out distinctly from their subspecies. The natural arrangement is to indent the list of subspecies, to form a vertical column farther to the right than the column of specific names. Under this scheme the Nuthatches, for example, would appear as follows:

- SITTIDAE. Nuthatches.
- 727 *Sitta carolinensis*  
     White-breasted Nuthatch  
         727z *S. c. carolinensis*  
             (Carolina?) White-breasted Nuthatch  
     727a *S. c. aculeata*  
         Slender-billed White-breasted Nuthatch  
     727b *S. c. atkinsi*  
         Florida White-breasted Nuthatch  
     727c *S. c. nelsoni*  
         Rocky-Mountain White-breasted Nuthatch  
     727d *S. c. lagunae*  
         San Lucas White-breasted Nuthatch
- 728 *Sitta canadensis*  
     Red-breasted Nuthatch
- 729 *Sitta pusilla*  
     Brown-headed Nuthatch

730 *Sitta pygmaea*

Pygmy Nuthatch

730z *S. p. pygmaea*

(Northern?) Pygmy Nuthatch

730a *S. p. leuconucha*

White-naped Pygmy Nuthatch

Such an arrangement brings out at a glance the fact that there are four species of Nuthatches on the list, one of which embraces five geographical races, while two others are as yet undivided and the fourth embraces two varieties. In the following summary an attempt has been made to present in concise form the substance of the suggestions of the preceding paragraphs.

## SUMMARY OF SUGGESTIONS

- (A) The trinomial system should be followed consistently for English names as well as for Latin names.
- (1) Every species in the A. O. U. list should have an English name whether the species is subdivided into races or not.
  - (2) Wherever subspecies are involved, each subspecies should be designated by the English name of the species preceded by an English subspecific term.
  - (3) Specific common names are preferably descriptive, while subspecific names may more appropriately refer to localities or the names of persons, as well as to minor characteristics.
  - (4) The possessive form should be used only for subspecific names; not for the names of species.
  - (5) A misleading or distinctly false "popular" designation is very unfortunate from an educational standpoint and should not be permitted by the A. O. U. to stand as its officially recognized English name of a species or genus.
- (B) Each species in the A. O. U. list should retain its permanent number, without letters affixed, as at present.
- (C) Every race, or subspecies, of a given species, should have assigned to it a letter of the alphabet, to be used in conjunction with the number assigned to the species.
- (1) For the first-described or type race of a species, assign the letter *z*.
  - (2) For all other races of a species retain the letters, *a*, *b*, *c*, *d*, etc., as at present assigned, using the next succeeding letter of the alphabet for each new race.
- (D) The abridged check-list should be so arranged that all species will stand out distinctly from their subdivisions. Species and subspecies should not occupy columns of equal prominence.

Springfield, Illinois, June 26, 1922.

## CACTUS WRENS' NESTS IN SOUTHERN ARIZONA

By FLORENCE MERRIAM BAILEY

AT the north base of the Santa Rita Mountains between 4000 feet at McCleary's, now Nicholson's (where we camped during the winter of 1920-21), and Continental at 2900 feet on the Tucson-Mexico spur of the Southern Pacific, throughout both the mesquite and catsclaw slopes leading down from the mountains and the cholla cactus flats of the lower terraces, nests of the Cactus Wrens (*Heleodytes brunneicapillus couesi*) were the most conspicuous ornithological features of the landscape.

Near 4000 feet a well-populated patch of mesquite, catsclaw, and zizyphus, which was conveniently located on the Continental road and bordered above by the fence of the cattle ranch and below by the telephone line from Madera (White House) Canyon, included approximately fifty-three acres and was utilized for an intensive study of Cactus Wren nests.

Thirty-seven nests of sufficiently recent use to show in which direction they faced were found here. Seven of these were certainly disused, and three apparently so, the remaining twenty-seven, in January or February, showing fresh entrance material or other signs of readiness for occupation.

## WINTER ROOSTS

About the middle of December, when a flurry of snow whitened the Santa Rita peaks and a number of cold nights made warm nests especially desirable, I surprised two Cactus Wrens busily carrying warm lining materials to a nest in a ball of mistletoe. Remembering Mr. Anthony's notes in *Zoe* (II, 2, pp. 133-134) on the remodelling of New Mexico Cactus Wrens' nests for winter roosts, I looked forward to seeing more of the interesting process. But his dates, which I had forgotten, showed that the work of rebuilding was going on during pleasant weather from October 24, and about the first of December "all of the nests of the vicinity were so thoroughly repaired that they had every appearance of new nests." In the *Nidologist* he recorded finding the wrens "hidden in their nests during a snowstorm in November."

Unfortunately I did not begin taking the census of the fifty-three acres until January 12, and no other Cactus Wrens were seen carrying material until spring. By January 18, when I had listed and tagged thirty-one of the thirty-seven nests, the structural part of the remodelling was all too evidently finished, although a few straws and many feathers were added to some of the nests still later. From January 13 to February 15, twenty-three of the twenty-seven good nests on the fifty-three acres were found occupied at sunset, which by repeated experiment was proved to be the retiring hour. Among the miscellaneous nests outside the fifty-three acres (also examined at sunset) on February 2 and 11 seven more were found occupied, making a total of thirty nests found used as winter roosts. Much to our surprise, on our twilight rounds a Bewick Wren was twice flushed from one of the Cactus Wren nests. A cholla cactus nest of the Cactus Wren in the giant cactus belt below, had also been used as a roost by a bird of another species, the mouth of the nest being carpeted with the ordure of a large bird.

## BREEDING SEASON

When taking the nest census on January 15, a warm day that might have suggested nesting time, I heard an outburst of song and found four Cactus Wrens excitedly gathered about one tree which contained two old, broken-down nests. Two of the birds were singing with great animation, one on top of a bush spreading his tail. On January 29, another spring-like day, Mr. Bailey found some of the wrens in the fifty-three acres "singing, chasing, and fighting." Then, on February 15, what appeared a bit of courtship rivalry was witnessed. But on repeated visits the fifty-three acres was oppressively silent. On April 10 songs were heard suggesting that it was time to be watching for real nest work, but the songs came from only two or three places. In one of these the day before, April 9, I had found a nest in the first stages of construction. Outside the fifty-three acres, in the bottom of a neighboring hot wash, on April 13, Mr. Bailey found a nest being built in a cholla, both wrens gathering bills-full of grass and slender stems from the ground, and singing as they worked. Another cholla nest on the fifty-three acres had been begun before May 1, the week of our departure. But on April 30 about half of the accessible roosting nests were examined for sitting birds in the daytime, and nothing was discovered.

In the adjoining Catalina region, Mr. W. E. D. Scott has said the first eggs are laid as early as March 20; and on March 13, 1885, Mr. Herbert Brown of Tucson reported nesting well under way, the general nesting season, correlated with February rains, being unusually advanced. But as the winter of 1920-21 was marked by severe drought, said to be the worst in thirty years, the breeding season as well as the vegetation may well have been retarded. Whether this was the case, or the fault was mine in failing to discover the breeding nests, the unfortunate fact remains that I was unable to correlate the summer and winter uses of the nests and had to leave unanswered many of the questions I had hoped to answer; among them—How many of the roosting nests were cock nests and how many of them would be used by the females for their eggs and young?

## NESTING SITES

While many of the nests were grouped within a small radius, in some cases two or three being in the same tree, on the other hand, isolated nests were far from being the exception. Suitable bunches of mistletoe for building sites seemed one of the controlling factors.

While the name Cactus Wren was justified in this locality as in others by the innumerable nests found in cholla cactus, here thorny trees and bushes especially catsclaw and zizyphus (*Z. lycioides*) or lote bush, were also used extensively, while mesquite and the dense shrubby hackberry or grenjeño were used occasionally for nesting sites. It was interesting to note that zizyphus bushes containing nests generally stood under mesquite trees, so getting double protection. The protection afforded by the armament of thorns was often so complete that it was impossible to reach a nest without cutting away the obstructing branches. Even that, however, did not always satisfy the nest makers, for such bulky, conspicuous nests need to be safeguarded in every way from hawks, owls, and other enemies. Thirty-five out of sixty-four nests examined were not only protected by the entangling thorns of the surrounding branches but were built within clusters of the red-flowered mistletoe (*Phora-*

*dendron californicum*) which in many cases partially or wholly concealed them. One nest lay on a level branch covered by an unusual horizontal growth of mistletoe and showed only as a darkened mass inside, but most of them were in round ball-like masses of mistletoe, commonly at the ends of branches in terminal mistletoe rosettes, frequently so dense that it was impossible to obtain nest statistics or photographs. One of the nests without mistletoe protection was built under an umbrella-like mass of foliage.

#### NEST CONSTRUCTION

In form, the Cactus Wren's nest suggests a retort, having a large globular chamber about six inches in diameter approached through a long passageway or entrance, the whole normally about twelve inches in length, the mouth of the entrance being about three inches above the base of the globular chamber. This nest chamber in course of years becomes a thick felted mass of gray, weathered plant fibers so hard that saucer-like sections sometimes crack off from the back, showing the solid, sodden bottom of the nest. The entrance, on the contrary, is made of long straw-like plant stems which may easily get blown about and so often need replenishing.

When the old nests are repaired and ready for winter use these new straw-colored entrances often afford a striking contrast to the old gray globes, although occasionally the new material is lavishly distributed over the whole top of the nest. One nest, found on March 21, looked new, only straw-colored material showing from the few possible points of observation; but it might easily have had merely a coating of fresh material. A mass of fuzzy plant material was outside the mouth. An old gray nest fragment which might have supplied foundation material was behind the nest. Besides replenishing the straw entrance, the wrens re-line for cold weather. In one instance fur, and in many instances the small gray body-feathers of the Gambel Quail, and sometimes well-marked feathers of other species of birds, were seen in the entrances and about the mouths. One nest used for roosting purposes during the winter, when examined for eggs on April 30, had its globular chamber so thickly lined with soft feathers that it suggested a feather bed.

Considerable variation and adaptability were shown in the construction of the nests examined. Sometimes in the process of repair the angle of the entrance was changed. In one case, while the old nest faced east, the new entrance faced south by east, almost at right angles, presumably for better support for the mouth and larger twigs for perches at the mouth. The contrast in angle was emphasized by the color difference, the old nest chamber (about seven inches long and sagged at base) being gray and weathered, while the new entrance (about six inches long) was straw colored.

As it has been said, more than half the nests in other than cactus were built inside a round ball-like mass of mistletoe and were supported by its innumerable twiglets. The value of this support is realized when considering the tendency of the hard outer shell of the globular chamber to crack off if unsupported.

In one instance the mistletoe protection made the builders extra work, for the diameter of the mistletoe ball was so great that the hallway of the nest had to be abnormally extended to provide an exit for the family at the outer edge of the ball. When not built inside a mass of mistletoe the nest was variously supported—by a crotch, by a horizontal branch and the trunk of

the tree, or by an angle of branches. In one case the whole nest lay along a drooping branch so that the entrance was at the same height as the bottom of the globe instead of three inches above, as commonly. Here, as if to preserve the integrity of the nest chamber, it was high arched, the deepest part measuring seven inches. In some cases for structural or other reasons the entrance was much lower or higher than typical, varying from almost level to four, five, and seven inches above the base of the retort. In one unusually large nest, evidently generations old, fresh material piled on lavishly kept the entrance high above the old sagged base.

An extreme instance of the tendency to utilize the mass of material already gathered in an old nest rather than to gather new material to build from the foundations up was shown in a nest that was being completed when we left. The old weathered remnant which was flattened down and drawn out horizontally was taken as roofing for the new nest although the nearest support for a base was about ten inches below the roof. To partly fill the gap the lighter material of the entrance of the old nest was pulled down. Whether the resulting structure satisfied the builders or not, we left too early to tell. While the entrance of the old nest had faced northwest, that of the new one faced southeast. In another peculiar remodelled nest the old one was a cup with the entrance on top. A few fresh straws were found here on January 30 but on February 22 there were no further signs of work or of use.

An inferior nest supported poorly except at the back and exposed on top was beginning to break down and stood all winter unrepaired and unused. Another inferior nest had the entrance so poorly supported that it was blown apart and had caved into the twigs several inches below. In still another the bulky globe protruded conspicuously and a slab was cracking off the back. A high nest, at the tip of a long branch about nine feet above the ground, stood with big gaping mouth and dangling straws, suggesting the visit of an owl; while an unusually low nest, within easy reach of ranging horses and cattle, had one of its supporting twigs broken off, the nest material being strewn over the branches for nine inches.

#### NEST MATERIAL

The material of this low, ruined nest, when examined by Mr. Gorm Loftfield, one of the Carnegie botanists conducting experiments on the neighboring U. S. Range Reserve, was found to contain eighteen species of plants, as follows:

<i>Pectocarya</i>	<i>Hosackia trisperma</i>
<i>Allocarya</i>	<i>Acacia constricta</i>
<i>Franseria tenuifolia</i>	<i>Acacia greggii</i>
<i>Plantago ignota</i>	<i>Prosopis j. velutina</i>
<i>Gilia aurea</i>	<i>Portulaca</i>
<i>Phacelia distans</i>	<i>Muhlenbergia porteri</i>
<i>Eriogonum polycladon</i>	<i>Heteropogon contortus</i> (young plant)
<i>Eriogonum abertianum</i>	<i>Scleropogon brevifolius</i>
<i>Lupinus parviflorus</i>	<i>Aristida bromoides</i>

Another nest examined by Mr. Bailey had a long *Plantago* stem sticking out in front and others attached to the body of the nest, and included several species of long-stemmed grass, *krinitzkias*, and wild mustard. Feathers of Road-runner and Sparrow Hawk were found on the outside, and downy feath-



ers in the hallway. A new cholla nest that was being built on our departure was notable for its beautiful pearly seed-scales taken from the Ephedra, scales which suggested white rosettes. Plant materials from a cholla nest were identified by Mr. Gorm Loftfield as follows:

Eriogonum polycladon, fair amount.  
 Eriogonum abertianum, fair amount.  
 Evolvulus (argenteus?), some.  
 Haplopappus gracilis, little.  
 Chaetochloa composita, fair amount.  
 Lupinus parviflorus and Hosackia trisperma, fair amount in one part of nest, practically none elsewhere.

Aristida divaricata, much.  
 Aristida bromoides, much.  
 Bouteloua rothrockii, fair amount.  
 Bouteloua aristidoides, some.  
 Andropogon saccharoides, fruits mostly.

#### DIRECTIONS FACED BY NESTS

A study of the direction faced by the nests was taken up to determine if the birds were influenced in building by the prevailing direction of the winds and storms which come from the Gulf of California to the southwest, from which would also come the hottest, most prolonged summer sunshine.

In the summaries given beyond, the directions between the cardinal points of the compass are lumped and seem to indicate a preference for the sunny and windy exposure. Taking the nests facing only directly southwest, however, we have only fourteen out of ninety-five; but in a matter of wind and sun narrow limitations seem unsafe for generalizations.

It can be fairly said, nevertheless, that southwest nests, not in cholla, so far as could be determined through obstructing mistletoe, were so well supported and protected as to be practically storm proof. Perhaps the most striking of these was in a catslaw surrounded by dense mistletoe, for it lay on the main leaning trunk and was arched so low as to present a strong wall to the wind.

The damage done to badly situated and poorly constructed and protected nests was easily seen, in one case the whole entrance being blown to one side. The cholla nests especially showed evidence of being beaten by the wind, many of them lying on top of low cactus, inadequately anchored and open to the storms.

#### SUMMARY

##### I. THIRTY-SEVEN NESTS INSIDE THE 53 ACRES

*Location.* Of the 37 nests, 21 were in catslaw (15 in red mistletoe), 15 in zizyphus, and 1 in mesquite (in red mistletoe).

The approximate height from the ground varied from 4 to 9 feet; 5 were 4 to 5 feet; 9, 5 to 6 feet; 11, 6 to 7 feet; 5, 7 to 8 feet; and 7, 8 to 9 feet.

*Approximate length of nests.* Those whose outline could be seen varied from 7 to 12 inches, 12 inches apparently being the normal length.

*Feathers seen at entrance.* In 15 of the nests low enough to be examined, feathers were seen either in the mouth or outside the entrance. Sometimes they were scattered among the leaves below as if dropped from the entrance.

*Disused nests.* Only 7 surely, and 2 probably, were disused.

*Wrens found roosting in nests.* Of the 23 wrens found, the earliest was discovered at 4:28 P. M. (January 13), no others being found for nearly an hour later. Practically all went in at sunset, the afterglow being noted at 6:10. The records ran: 5:40 P. M. January 30; 5:53 P. M. February 3; 5:54 P. M. January 30; and 5:55, 5:55+, 6:01, 6:03, 6:05, 6:05+, 6:07, 6:10 (also February 3), 6:10+, 6:12, and 6:13 P. M. February 2; most of the others being recorded after sunset.

## II. TWENTY-SEVEN MISCELLANEOUS NESTS OUTSIDE THE 53 ACRES

*Location.* Of 27 nests, 17 were in catsclaw (14 in red mistletoe), 2 in zizyphus, 4 in mesquite (in red mistletoe), and 4 in shrubby hackberry.

The approximate height from the ground varied from 4 to 9 feet, 2 being 4 feet; 7, 5 to 6 feet; 6, 6 to 7 feet; 4, 7 feet; 6, 8 to 9 feet; and 2, 9 feet.

*Approximate length.* One over 10, and one, 13 inches, were recorded.

*Feathers seen at entrance.* In 6 nests.

*Wrens found roosting in nests.* Of the 7 found, one was recorded at 5:45 P. M. February 2; the rest "at sunset," February 11.

## III. LOCATION OF 64 NESTS INCLUDING 37 ON THE 53 ACRES AND 27

## MISCELLANEOUS ONES OUTSIDE THE 53 ACRES

Of 64 nests, 38 were in catsclaw (29 in red mistletoe), 17 in zizyphus, 5 in mesquite (in red mistletoe), 4 in shrubby hackberry; and altogether 34 in red mistletoe.

The approximate height from the ground varied from 4 to 9 feet, 7 being 4 to 5 feet; 16, 5 to 6 feet; 17, 6 to 7 feet; 9, 7 to 8 feet; and 15, 8 to 9 feet.

## IV. THIRTY-ONE NESTS IN CHOLLA CACTUS

*Location.* In the 31 nests examined, the approximate height from the ground varied from 2½ to 6 feet, there being only one under 3 feet. There were 12 from 3 to 4 feet (3 being 3½ feet, 4 being 3 feet 9 inches); 13 from 4 to 6 feet (5 being under 5 feet); the height of 5 being unrecorded.

*Feathers seen at entrance.* In 10 nests.

*Disused nests.* Six surely, and one probably.

While some of the cholla nests examined were substantial and well protected, most of them were decidedly inferior to the nests found in other bushes and trees. Being lower and more exposed to wind and storm, especially in the case of those on top of the lowest chollas, they had apparently been blown to pieces, presenting a most dilapidated appearance. Of 6 nests in a radius of about 25 feet, there were good, old, and partly demolished ones.

Feathers of Gilded Flicker, Scaled Quail (scaled ones), and of Verdin (yellow ones) were found. In one nest hard to get at, overhanging straws suggested an entrance from below. One unfinished nest was curved around, while another had the mouth turned to one side, as if to avoid obstructing cactus arms.

## DIRECTIONS FACED BY NESTS

I. 37 nests on 53 acres: North, 4; northeast, 5; east, 1; southeast, 3; south, 3; southwest, 12; west, 2; northwest, 7.

II. 27 miscellaneous nests outside of 53 acres: North, 4; northeast, 3; east, 2; southeast, 6; south, 4; southwest, 5; west, 2; northwest, 1.

III. 64 nests, including 37 on 53 acres and 27 miscellaneous ones outside of 53 acres: North, 8; northeast, 8; east, 3; southeast, 9; south, 7; southwest, 17; west, 4; northwest, 8.

IV. 31 nests in cholla cactus: North, 2; east, 4; southeast, 4; south, 8; southwest, 8; west, 1; northwest, 4.

V. 95 nests, 37 in 53 acres; 27 miscellaneous, and 31 cholla nests outside 53 acres: North, 10; northeast, 8; east, 7; southeast, 13; south, 15; southwest, 25; west, 5; northwest, 12.

Washington, D. C., May 31, 1922.

NOTES ON THE SUMMER AVIFAUNA OF BIRD ISLAND, TEXAS,  
AND VICINITY

By ALVIN R. CAHN

WITH SEVEN ILLUSTRATIONS BY THE AUTHOR

SOME THIRTY miles south of Corpus Christi, Texas, and about four miles off the coast, there rise out of the Laguna de la Madre two tiny, sun-baked shell reefs, known locally as Big and Little (also South and North) Bird Islands. So small are these spots that they appear on but very few maps, and so unimportant are they that they are known only to a few well-informed ornithologists, local Mexican fishermen who raid them periodically for birds' eggs, and an occasional adventurous picnic party. Even the local game warden stationed at Corpus Christi has never visited the islands in the course of his long local service. In spite of which, the Bird Islands are today among the most interesting spots, ornithologically, in all Texas.

The Laguna Madre is a long, very narrow strip of water that is almost cut off from the Gulf of Mexico by the equally long, sandy ridge of Padre Island, which extends from opposite Corpus Christi southward, paralleling the coast, to Point Isabel near the mouth of the Rio Grande, a distance of about one hundred miles. Padre Island acts as a protective barrier to this section of the coast of Texas, receiving the brunt of the attack of the waters of the Gulf of Mexico. Yet even this protection is insufficient when the furious storms characteristic of the region sweep shoreward. At such times the waters, whipped into mountainous waves by a terrific gale, rise in their fury, completely overwhelm Padre Island, and rush madly on the coast, which then may be submerged beneath twenty or more feet of turbulent water. When this occurs (the last big storm was in September, 1919), the Bird Islands, which rise above the water a scant two or three feet at the highest point, sink completely from sight, to reappear again days after the storm is over. Such storms play havoc with the fauna of the islands, and, when they occur during the breeding period of the thousands of birds nesting upon them, a terrific loss of life results. Since the islands are so low, their shape and size are constantly changing to a greater or less extent, which accounts for the difficulty the writer had in getting any idea of the size of the islands prior to his visit.

Bird Island (in order to simplify matters we shall refer to Big Bird Island, where the writer did most of his work, simply as Bird Island) is composed mainly of crushed shells, with occasional patches of a black, mucky material, and a sprinkling of sand. The central portion is covered with a low, creeping, succulent vegetation which fairly covers the ground, but which fails to conceal even a brooding gull. A few prickly-pear cacti occur locally, and two scraggly clumps of sunflowers are the only plants that break the otherwise monotonous uniformity of the vegetation. There is no shade anywhere for anything larger than an insect, and the entire island lies gasping under a semi-tropical sun. The surrounding waters teem with fish and other aquatic life which afford an abundant food supply to the birds. As to the island, except for a few insects that are blown out from the shore, and a few crustaceans, notably the fiddler crab, which burrow into the wet beach, it is practically lifeless—except, of course, for the thousands of wheeling, screaming sea-birds that breed upon it. On this island, less than half a mile in length

and not over a hundred yards in width, so unattractive in its physical features, the writer, accompanied by Mr. W. A. Rounds and Mr. S. Welsh, spent the period between May 26 and June 2 inclusive, eight wonderful, unforgettable, sweltering days and nights, surrounded by thousands of clamoring birds, studying and photographing.

A number of papers have been published dealing with the birds of the general vicinity of Corpus Christi, and a few of these give casual mention to Bird Island. Of the older papers, those of Singley (1), Hancock (2) and Chapman (3) cover the general region, and the more recent paper of Pearson (4) lists a few of the species of birds found on the island. However, as far as the writer has been able to ascertain, nothing has been published dealing with this most interesting island as the focal point, and inasmuch as 68 species were identified on and about the island itself, it seems advisable to offer the list as it now stands. This paper is the third of a series of avifaunal studies undertaken by the writer (6 and 7), in various parts of the state of Texas.

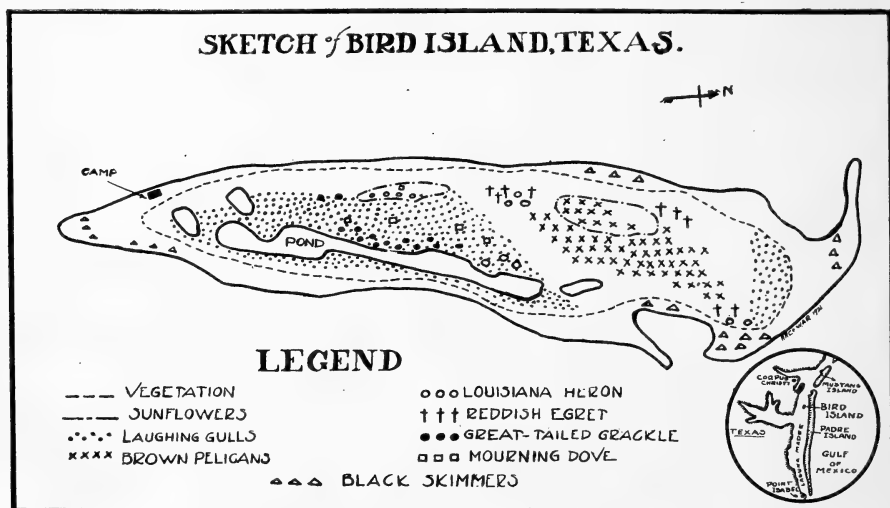


Fig. 39.

(Since this article was written, the writer has learned that the Bird Islands are among six small islands just rented by the National Audubon Society for a period of fifty years. This places the vast number of breeding birds under much needed protection. Both the Audubon Society and the state of Texas are to be congratulated on this great step in conservation.)

A list of the birds found by the writer in the vicinity of Bird Island follows.

1. *Podilymbus podiceps*. Pied-billed Grebe. Ten records are at hand, totalling sixteen individuals. Frequents the indentations of the shore-line, and nests in suitable (reedy) locations on the mainland. On May 30 one bird was found at daylight swimming about in the inland lagoon within the island.

2. *Larus delawarensis*. Ring-billed Gull. A single specimen, evidently dead for a period of weeks, was found in the heart of the pelican rookery. Undoubtedly a migrant only.

3. *Larus argentatus*. Herring Gull. Two circled over the island for nearly two hours on the morning of May 27. Their plumage was intermediate between the winter

and summer condition; the birds were either wanderers or non-breeding individuals such as are occasionally found far away from the nearest breeding ground.

4. *Larus atricilla*. Laughing Gull. An abundant breeding species. On Bird Island these gulls had but a single egg in the nest on May 26, when we arrived, and before we left practically every nest had its full complement. After the first egg has been laid, the subsequent eggs are deposited on successive days. On this island the average complement was three: out of 250 nests in which the laying was finished, 192 contained 3 eggs, 52 had 4 eggs, 5 had two, and a single nest contained but 1 egg. On Little Bird Island, nests contained the first egg on May 31. No young were hatched, and no eggs were found anywhere that were well along in incubation. My estimate showed about 2500 pairs of these birds on Bird Island, and about 600 pairs on Little Bird. The nests were invariably located among the succulent vegetation, the birds avoiding absolutely both the open beaches and the soggy edges of the inland lagoons. When we first reached the island the birds were very timid, and wheeled, screaming, over our heads, darting at us and making a great stir. This commotion spread rapidly the entire length of the island until thousands of silvery wings flashed in the sun. Soon, however, our presence was accepted, and, though our approach always sent a few into the air, the general alarm soon died, and the disturbed birds would return to their domestic duties in less than a minute. The greatest vocal activity in the colony occurred usually just at dusk and continued until well after dark. By ten o'clock at night things were fairly quiet, the "laughing" commencing again about three o'clock in the morning. Considering the early stage of incubation of the eggs, it was surprising to find the birds sitting so "close": one bird under observation was absent from her nest only eleven minutes in twenty-four hours. No amount of juggling the eggs confused the birds, which evidently return to the *spot*, rather than to the *eggs*. One bird refused to settle on her own eggs when the nest and contents were moved three feet from its original site. Replaced again later in the day, she returned to her incubation apparently quite unconcerned.

5. *Geochelidon nilotica*. Gull-billed Tern. About two hundred of these birds were seen daily on Bird Island which, in fact, they never left, though the species was not yet nesting. The birds spent most of their time on the east side of the island, circling only a short distance out over the Laguna.

6. *Sterna caspia*. Caspian Tern. Considerably more abundant, I believe, than the preceding species, but of much more restless habits. Pearson (4) reports "many young Caspians" on May 23, 1920. On June 2, 1921, it is interesting to note that the species had not even begun to nest, as no young birds, nor any old nests, were in evidence. In this connection it may be stated that the conditions on the island in 1921 differed radically from those reported by Mr. Pearson in 1920, many species being present in greatly reduced numbers (both adults and nests), and the whole breeding season apparently nearly a month later.

7. *Sterna maxima*. Royal Tern. An abundant breeding species, though not nearly as abundant as found in 1920 by Pearson. About 500 individuals frequented Bird Island, and about 200 more were found on Little Bird. The first egg laid by the species was found the morning we left the island, June 2, though the shallow depressions which were to serve as nests were in evidence two days earlier. It is evident that there were to be two nesting blocks, one in the sand and shell at the extreme south end of the island, and another just south of the bay at the northeast corner of the island. None of the nests contained lining material of any sort.

8. *Sterna sandvicensis aculeiflvida*. Cabot Tern. About 400 of these terns were present on Bird Island, and less than 100 on Little Bird. The species had not yet begun to nest, though it is a common breeding species on both islands.

9. *Sterna hirundo*. Common Tern. A few Common Terns were found on Little Bird Island, and one clutch of three eggs, perfectly fresh, was taken. Not really common, but a breeding species.

10. *Sterna antillarum*. Least Tern. A breeding species on Little Bird Island, and seen only twice at Big Bird. On the former island, fourteen nests, none containing over two eggs, were found. A little colony of five nests was found on the Laguna side of Padre Island, opposite Little Bird Island. The birds were very timid, and refused to be photographed.

11. *Hydrochelidon nigra surinamensis*. Black Tern. The presence of these

birds, which ordinarily breed so much farther north, is a little surprising. Every evening while we were on the island a flock numbering about eighty individuals came to Bird Island, appearing from the north at about 7 o'clock. The birds flew over and about the island for some quarter of an hour, flying at a great rate of speed, finally disappearing to the south, following the Laguna Madre. No Black Terns were seen at any other time, nor in any other place, nor is there any evidence of their breeding in the vicinity.

12. *Rynchops nigra*. Black Skimmer. An abundant breeding species. The nesting season was just beginning as we left, many nests containing two eggs on June 2; no nests were found containing more than two eggs. The nests were pretty well scattered about the edge of the island, though the greatest number were near the north-east end. About 400 birds were living on Bird Island, and about 50 on Little Bird, these



Fig. 40. A BROWN PELICAN AT HER NEST.

latter having two eggs in the nest on May 29. The birds were extremely active all day, and their hoarse, grating cries were heard well into the night after other bird sounds had practically ceased. Also, their voices were the first to be heard in the morning. After watching these birds carefully for eight days, the writer has no evidence to offer to show that they feed in the orthodox manner in which they have always been supposed to feed. On the contrary, he feels at the present time that Mr. Arthur (9) is correct when he says that the birds pick up their food while standing in the water. This I saw through powerful binoculars again and again when the birds stood in the shallows, and, though I watched hundreds of the birds "skimming", I never saw the slightest indication that they were catching fish while on the wing.

13. *Anhinga anhinga*. Water Turkey. Three "snake birds" were seen while we were on the way to the island on May 26. These were in every case sitting on old

piles or poles used by the fishermen in their seining operations. On May 30 two Water Turkeys were found at day-break sitting at the tip of the sand spit at the north end of the island. The birds do not breed on the island, as there is no suitable nesting site.

14. *Phalacrocorax vigua mexicanus*. Mexican Cormorant. About a dozen seen in the Laguna Madre during our travels to and from the island. A pair was seen daily at Bird Island, where the birds frequented the spit at the north end, spending hours at a time out of the water in company with the pelicans. It is altogether likely that the species breeds in suitable places along the Texas coast in this region, though we had not the time to hunt for their nests.

15. *Pelecanus erythrorhynchos*. White Pelican. There was no evidence of the presence of this species when we first reached the island. On May 30 a flock of seven was seen on Bird Island, and later in the day the same flock was seen again on Little Bird. These seven were seen daily from this date, and on the afternoon of June 1 a flock of forty-six came to Big Bird, and they were still there when we left the next day. Pearson found them with young already hatched on Little Bird on May 23, 1920; in 1921 either they were not breeding on the islands, or else the nesting had not yet begun. The behavior of the large flock indicated strongly that the nesting was not in progress. Compared with the Brown Pelicans, the White were extremely timid and could not be approached for photographic purposes.

16. *Pelecanus occidentalis*. Brown Pelican. An abundant breeding species on Bird Island only, where there were at least 400 nests as compared with the 48 nests found in 1920 by Pearson. The Pelicans occupied about one quarter of the island, and this region was occupied by no other species except a few Reddish Egrets that nested around the edge of the rookery. Almost every stage in the life history was present. Nests which contained perfectly fresh eggs, the complement not yet completed, were found by the side of nests already deserted by the young which were wandering about in great flocks, but which were not yet old enough to enter the water. Every stage in the development of the young was there: young were watched as they came from the egg—black, naked, hideous little creatures—while other nests showed families in all stages of down development and primary growth. The average number of eggs or young per nest was three. The young leave the nest almost before they are able to walk, and flop around on the ground using the wings and legs in their efforts at locomotion. These young do not wander far, but return to the nest, climbing back into it with the aid of legs, wings and bill. The food consists mainly of mullet (*Mugil cephalus*) and menhaden (*Brevoortia tyrannus*) as shown by regurgitations as well as by a peculiar habit evidenced in a number of cases where perfectly whole, fresh fish were placed in the nest with the young. These the babies pick at for a time, but do not eat, and the fish are allowed to remain in the nest until the stench is terrible. In fact, the whole pelican rookery reeked. The mortality among the young is very great, due largely to the heat. If the young chance to hatch during the absence of the adults, they are almost certain to die as a result of exposure to the unmerciful sun. A number of such deaths were witnessed, occurring within half an hour after hatching. Fully 200 eggs lay on the ground among the nests, decomposing in the heat, and every once in a while one of these would explode, reminding one in more ways than one, of a gas bomb! Many older birds, young well advanced in the wandering stage, were found dead, this being probably due largely to the punishment they receive if they chance to wander within the reach of the bill of an incubating pelican. The old birds whack the babies over the head with a snap of the bill that can be heard amid the din of the rookery for a distance of fifty yards. It is very evident that these blows daze the youngsters, who stagger away drunkenly as a result. For a further account of these birds, the reader is referred to a paper by the writer dealing with this rookery (7).

17. *Anas fulvigula maculosa*. Mottled Duck. Eight representatives of this species were seen en route to the island. These birds were found in little coves or bays of the mainland, and they undoubtedly breed in favorable localities. A single individual was seen sitting on the beach of Little Bird on May 30.

18. *Marila affinis*. Bluebill. A male and two females were seen off the north end of Bird Island on May 29, 30 and 31, on which date they disappeared. They were never seen to fly, and it is possible that they were "cripples" left over from the hunting season. It is altogether possible that such "winged" birds breed locally.

19. *Ajaia ajaja*. Roseate Spoonbill. Three "flamingos" were found on May 30



on Padre Island, just opposite Little Bird Island. They were flushed from a clump of shrubs upon which they were sitting, and flew across Bird Island, as nearly as could be seen, toward the mainland. There was no breeding evidence, but there is no reason why the species should not nest in suitable localities.

20. *Ardea herodias wardi*. Ward Heron. A common breeding species, both on the mainland and on the islands. There is a large colony near Flour Bluff (about 13 miles south of Corpus), the birds breeding high above the ground in trees. Six nests were found on Bird Island, and twenty-three on Little Bird. On the latter island the nests contained fresh eggs, the full complement in many cases not reached, while on Big Bird, a young heron was found already out of the nest. On the islands the nests were built of necessity upon the ground, and were made of huge piles of twigs, grass, weeds, etc., much of which had to be brought either from Padre or the mainland. In



Fig. 41. YOUNG BROWN PELICANS.

many cases Brown Pelicans had used the nests of this heron for their own, and in one case two rotten heron eggs were found in a heron nest occupied by two very recently hatched pelicans. The species also breeds locally on Padre Island.

21. *Egretta candidissima candidissima*. Snowy Egret. A single specimen of this beautiful species was seen on the afternoon of May 30, standing on the beach of Padre Island, just across from Bird Island. The bird permitted close approach, and was not at all timid.

22. *Dichromanassa rufescens*. Reddish Egret. A common breeding species on both Bird Islands. About twenty nests were located on Little Bird, and thirty-seven on Big Bird. These nests contained, on the average, three eggs, which began to hatch on June 1. The nests were built among the succulent vegetation, from two to six inches above the ground, which is the best elevation the birds could obtain under the circum-

stances. No birds in the white phase were seen. The adults were quite timid.

23. *Hydranassa tricolor ruficollis*. Louisiana Heron. An abundant breeding species, somewhat more common than the preceding, on both islands. The nests were very similar in construction, position, and in the condition of the eggs, though there were no young hatched when we left. Distinctly less timid, the birds were, however, unapproachable for photographic purposes.

24. *Florida caerulea*. Little Blue Heron. Five individuals of this species were seen on Padre on June 1. There is no evidence of breeding in the vicinity.

25. *Butorides virescens virescens*. Green Heron. A breeding species locally along the mainland, where the birds nest in low trees, often mesquite. Several visited the inland lagoon on Bird Island on May 27, 30, and June 2. Seen twice en route to the island, flying near the shore, and once on Padre on May 30.

26. *Nycticorax nycticorax naevius*. Black-crowned Night Heron. Seen only on Padre Island, where four birds were seen on June 1. These birds seemed very much concerned at our presence, and their actions indicated the possibility of a nest. Heard often during the night, when their hoarse croaking indicated that the birds were going toward the mainland.

27. *Gallinula galeata*. Florida Gallinule. A single bird of the species, in full summer plumage, was in the lagoon on the island when we arrived. It left at once, but was back again the next morning. When the bird left this time it did not return.

28. *Fulica americana*. Coot. A single Coot was present on Big Bird Island all the time we were there. It frequented the sand spit at the north end, and was always in close association with the pelicans. Whenever the pelicans left the island, the coot went along; when they returned, it returned also. There was no sign of a mate. Several coots were seen near the mainland at various times.

29. *Himantopus mexicanus*. Black-necked Stilt. One individual of this beautiful species—the first the writer had seen alive—was found wading at the edge of the water on Little Bird Island on May 29. As we approached, it flew a short distance, then settled on the water and swam toward Padre. No breeding evidence.

30. *Macrorhamphus griseus griseus*. Dowitcher. One representative of this species was seen twice on Little Bird. As the species is rare in this region during the late spring, and as the bird showed marked difficulties in flying, I am led to the belief that the bird was a stranded "cripple" left over from the shooting season.

31. *Pelidna alpina sakhalina*. Red-backed Sandpiper. A flock of nine of these birds was seen May 27, 28, and 29, on Bird Island. The birds frequented the shore-line and the edge of the large lagoon within the island, and were very tame. Remained at the south end of the island most of the time, often coming within a few yards of our camp. Migrants only.

32. *Calidris leucophaea*. Sanderling. Two dead individuals were found at the north end of Little Bird Island, badly disintegrated, but identifiable by the absence of the hind toe. Migrants only.

33. *Totanus melanoleucus*. Greater Yellow-legs. Three Greater Yellow-legs were seen on Bird Island the day we arrived, but were not seen again. Padre Island, May 30, two; Little Bird Island, May 31, three. Migrant only.

34. *Totanus flavipes*. Lesser Yellow-legs. A little flock of six frequented the south end of Bird Island near camp during our entire stay, seldom leaving the point unless frightened by our approach.

35. *Numenius americanus*. Long-billed Curlew. Two birds of this species were standing near the water on Little Bird when we approached it on May 31. The birds were so tame that we rowed past within twenty-five feet of them. These birds remained on the island all that day, leaving toward dusk.

36. *Oxyechus vociferus*. Killdeer. A common breeding species along the mainland and on Padre Island, where young birds were already hatched on May 30. Several of the species were seen on Bird Island, where they remained only for a few hours.

37. *Aegialitis nivosa*. Snowy Plover. Several pairs of this plover were seen on Padre Island, and a single bird visited Bird Island on May 30. From the behavior of the birds on Padre, I have no doubt that they breed there, though the nests were not found.

38. *Ochthodromus wilsonius*. Wilson Plover. A common species along the coast, and seen on all of the islands. Breeds in suitable places, but nesting had not yet begun when the writer left the region.

39. *Haematopus palliatus*. Oyster-catcher. I was considerably surprised at the scarcity of this bird in such a favorable location. Only three of the species were seen, two on Padre and one on Bird Island. Probably a breeding species, and very likely more common than present data would seem to indicate.

40. *Colinus virginianus texanus*. Texas Quail. One small flock of seven was seen on Padre, but the birds could be heard daily both on Padre and on the mainland. Data indicated the species as common, and it breeds on Padre. None was seen on Bird Island, and it is more than likely that the Padre Island birds do not travel across the Laguna Madre to the mainland, as there is an abundance of food on the island.

41. *Zenaidura macroura carolinensis*. Mourning Dove. A breeding species on both of the Bird Islands. On Big Bird five nests, each containing two fresh eggs, were found. These nests were in all cases among the nests of the Laughing Gulls. Breeds



Fig. 42. NEST AND EGGS OF THE GREAT-TAILED GRACKLE.

also very commonly on Padre Island. The doves were seen repeatedly going to the mainland for their food.

42. *Chaemepelia passerina pallescens*. Mexican Ground Dove. About ten of this small species were seen, both on Padre Island and on the mainland, though none happened to be seen on Bird Island. Most likely a breeding species in the vicinity, but no nests were found.

43. *Scardafella inca*. Inca Dove. Four were seen between Corpus Christi and Flour Bluff, and two more on Padre Island on May 31. Also probably a breeding species.

44. *Cathartes aura septentrionalis*. Turkey Vulture. A common breeding species on the mainland, and in suitable places on Padre. Seen daily flying high in the air. Occasionally the birds visit Bird Island, probably attracted there by an odor that would drive most other creatures away!

45. *Cathartes urubu*. Black Vulture. Distinctly less common than the preceding species, but seen almost daily from Bird Island. The species breeds commonly on the mainland, and also probably on Padre.

46. *Circus hudsonius*. Marsh Hawk. A common breeding species in the low, marshy regions of the coast, seen only once over the Laguna Madre near Bird Island. A considerable number was noted between Corpus and Flour Bluff, where there is much low country.

47. *Parabuteo unicinctus harrisi*. Harris Hawk. A familiar daily sight was the high-circling flight of this characteristic south Texas hawk. Between Corpus and Flour Bluff nine of these large hawks were passed, sitting quietly on telegraph poles along the road, indifferent to the traffic beneath them. Probably breeds on the mainland, though no attempt was made to find a nest.

48. *Falco sparverius sparverius*. Sparrow Hawk. A very common breeding species on the mainland and on Padre, and seen but twice from Bird Island. The species lives almost entirely upon the large grasshoppers so abundant in the region. One of the species was found dead on Bird Island.



Fig. 43. BLACK SKIMMERS INCUBATING.

49. *Polyborus cheriway*. Audubon Caracara. This queer looking "Mexican buzzard" was seen between Corpus and Flour Bluff—a small flock of six standing on the ground near the road. Again, a single individual visited the pelican rookery on Bird Island on June 1, evidently in search of fish, which it found. Standing on the sand spit at the north end of the island, the bird leisurely tore up and devoured a large mullet.

50. *Geococcyx californianus*. Road-runner. Common on Padre Island only, where breeds in the mesquite thickets. This island seems to be an ideal place for the birds, there being fine breeding sites, and great open sand stretches across which the birds race with most astonishing speed. There is an abundance of insect and reptilian life on the island to afford the birds plenty of food.

51. *Coccyzus americanus americanus*. Yellow-billed Cuckoo. Seen several times on Padre Island, where also a nest of the species was found in a mesquite thicket. A dead specimen was found on Little Bird Island on May 30.

52. *Ceryle alcyon*. Belted Kingfisher. Several seen near Corpus Christi, and again at Flour Bluff, where there are good nesting grounds. A single bird flew, rattling, over Bird Island on May 27, heading for Padre, where there is also a local abundance of good nesting sites. Not as common as one would expect.

53. *Chordeiles acutipennis texensis*. Texas Nighthawk. Seen from shortly before sun-down until dark, and after dark their call-notes could be heard coming from the black void overhead, even above the muttering of the restless birds on the island. Seen over Padre repeatedly, and the species undoubtedly breeds in the vicinity.

54. *Archilochus colubris*. Ruby-throated Hummingbird. Seen twice on Padre, both times the birds coming to rest on the smaller branches of a mesquite tree. On May 29 a male flashed by camp on Bird Island, headed for the mainland. No breeding evidence at hand, though the species is known to breed near Corpus.

55. *Muscivora forficata*. Scissor-tailed Flycatcher. Seen several times on Padre



Fig. 44. PORTRAIT OF A LAUGHING GULL INCUBATING.

Island, and often on the mainland, in both of which places the species nests. On Padre a bird was seen carrying a good-sized grasshopper, but no nest was found in the very limited time available. Often seen flying over Bird Island, going either to or from the mainland.

56. *Sayornis phoebe*. Phoebe. Common on Padre and on the mainland, but there is nothing to attract the species to Bird Island. On Padre two nests were found under the eaves of an uninhabited shack a little south of Bird Island. Both nests were empty, but gave evidence of having been very recently inhabited.

57. *Cyanocitta cristata cristata*. Blue Jay. Common on the mainland, where the species breeds in abundance. Seen also on Padre, though there is no evidence of breeding on the island. Visited Bird Island several times in passage between Padre and the mainland.

58. *Corvus brachyrhynchos brachyrhynchos*. Crow. Common throughout the re-



gion, breeding (early in April) on the mainland and on Padre. Seen only as transients over Bird Island.

59. *Molothrus ater ater*. Cowbird. Common along the main coastal region, particularly between Corpus and Flour Bluff.

60. *Molothrus ater obscurus*. Dwarf Cowbird. This subspecies, almost indistinguishable from the preceding when seen in the field, was found on Padre Island, May 31, as well as at Flour Bluff on May 26. Decidedly less common than its larger relative.

61. *Megaquiscalus major macrourus*. Great-tailed Grackle. An abundant breeding species on both Bird Islands. The nest is a beautifully built affair of grass, very deep and solidly constructed, located just off of the ground in the succulent vegetation. No nest contained more than three eggs, a majority of them containing but two. All



Fig. 45. NEST AND EGGS OF THE LAUGHING GULL.

the eggs were well along in incubation, and some nests contained young birds well feathered. Pemberton (8) speaks of the depredation of these birds on the eggs of the Reddish Egret. On Bird Island these two species were living quietly and harmoniously side by side.

62. *Cardinalis cardinalis cardinalis*. Cardinal. A common breeding species on the mainland and on Padre, not seen on Bird Island.

63. *Passerina ciris*. Painted Bunting. A single full-plumaged male was seen on Padre on May 31, the only evidence at hand of the presence of the species.

64. *Progne subis subis*. Purple Martin. An abundant breeding species, particularly near Corpus Christi. Found nesting near the uninhabited shack on Padre, the young birds being on the wing on May 31.

65. *Iridoprocne bicolor*. Tree Swallow. A common breeding species in suitable localities on the mainland. Occasionally seen over Bird Island, flying low over the Laguna Madre in pursuit of insects.

66. *Mimus polyglottos leucopterus*. Western Mockingbird. Abundant breeding species on Padre and the mainland.

67. *Toxostoma curvirostre curvirostre*. Curved-billed Thrasher. Several thrashers of this species were seen, and the species no doubt breeds, on Padre Island, as young birds were found.

68. *Penthestes carolinensis agilis*. Texas Chickadee. A common breeding species on Padre, seen also on several occasions on the mainland. Young birds were already out of the nest on May 31.

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*Department of Biology, Texas Agricultural and Mechanical College, College Station, Texas, April 17, 1922.*

## FROM FIELD AND STUDY

**Top Speed of the Road-runner.**—While motoring along a paved road, August 15, 1921, I had an unusual opportunity of recording the speed of the fast-running Road-runner (*Geococcyx californianus*). The road was situated just above the sea in a private estate known as the Hope Ranch, near Santa Barbara. We were just entering a long driveway bordered on either side with palms, and coasting along on about a three per cent grade, when a Road-runner appeared a few rods ahead. The car gained on the bird until about five yards separated us, and I saw it was running at its utmost speed. I instructed my friend, who was driving, not to press him further, and for fully three hundred yards the bird ran from the huge monster in pursuit, the while the speedometer registered exactly fifteen miles per hour. When finally we approached very closely, the bird gave up and flew into a palm, where I plainly saw it, beak agape and apparently much fatigued from the unusual exertion. Shortly after, I saw it sail to the ground and trot slowly away.

The proximity of the car and the closely grown palms were undoubtedly the two obstacles that kept the Road-runner on a straight-away course. It seemed baffled; from its viewpoint the palms probably appeared like a solid hedge. During the run, the bird's position was almost a straight line from beak to tip of tail. The tail drooped a little below the back and was frequently wagged up and down.—H. H. SHELDON, *Santa Barbara, California, June 15, 1922.*

**A Southern Station for the Harlequin Duck.**—The southernmost record-station for *Histrionicus histrionicus* on the Pacific Coast previous to the present note is Carmel Point, Monterey County, California (Beck, Proc. Calif. Acad. Sci., 4th ser., iii, 1910, p. 69).

About noon on October 8, 1918, at a place on the coast of San Luis Obispo County



about two and one-half miles south of Piedras Blancas, Mr. Joseph Dixon and I saw a full-plumaged male Harlequin Duck diving repeatedly in the rough water among the outlying rocks about 60 yards from the brink of the low bluff where we stood. Some minutes later, the bird hauled up on the side of a rock facing the shore, where it sat some three feet above the surface of the water, preening vigorously. Its conspicuous markings, even to the chestnut of the flanks, showed plainly. Mr. Dixon took a photograph of it at 50 yards range; the image, although too small for reproduction, is there with some detail—perfectly good, permanent “evidence” of the identity of the duck (photo no. 2825, Mus. Vert. Zool.).

On October 14, we passed the place again, and this time saw a pair of Harlequin Ducks in flight above the surf, one very close behind the other, the female foremost.

There is a great extent of rough coast-line, with numerous off-shore rocks, along Monterey and San Luis Obispo counties—just such territory as the Harlequins seem to prefer when not on the inland mountain streams to which they resort during a brief period of the year for nesting. These ducks may well be present there in some numbers and yet as a rule be beyond eye-range from shore.—J. GRINNELL, *Museum of Vertebrate Zoology, University of California, Berkeley, June 19, 1922.*

**Some New Birds for Oklahoma.**—In the farthest northwestern corner of the Oklahoma panhandle, two miles from New Mexico and eight from Colorado, I found several species of birds that apparently have not been previously reported from this state. This is a region of sand-stone mesas, covered with a sparse growth of pinyons, junipers (*Juniperus monosperma*) and scrub oaks; the elevation varies from about 4600 feet in the valley where the town of Kenton is situated, to about 4800 feet on top of the surrounding mesas.

*Aphelocoma woodhousei*. Woodhouse Jay. Three of these birds were seen on the mesas, June 1, 1922, and two the next day. No new nests were found, but we saw a number of old ones, mere platforms of twigs, that apparently could have belonged to no other bird.

*Cyanocephalus cyanocephalus*. Pinyon Jay. There were three pairs of these noisy jays on the mesas June 1. My daughter Constance found one of their nests containing an egg and two newly hatched young; this was in a juniper eight feet from the ground. We saw four or five old nests in the junipers and pinyons.

*Peucaea cassini*. Cassin Sparrow. We saw and heard four of these exquisite songsters from May 30 to June 2; they were all in alfalfa fields about Kenton.

*Pipilo fuscus mesoleucus*. Canyon Towhee. Common on the sides of the mesas. We found three nests, one on June 1 and two on June 2; the first two each contained three eggs, one being in a juniper and the other in a pinyon, while the last nest was situated in a tree cactus and contained three young.

*Psaltiriparus plumbeus*. Lead-colored Bush-tit. A pair of these little birds, and also a single individual, were seen on the mesas June 1 and 2.—MARGARET M. NICE, *Norman, Oklahoma, June 27, 1922.*

**Notes from Imperial Valley.**—Duck Hawk (*Falco peregrinus anatum*). While exploring a marsh that in proper season is a popular duck-hunting preserve, near Calipatria, I observed the following novel method of a Duck Hawk in attacking its prey. Three Shovellers had risen near the boat, and at a distance of perhaps seventy-five yards were about fifty feet above the water, when a hawk rose swiftly from concealment among the tules and fastened to the rear of the hindmost duck. The flapping of both attacker and victim carried them about fifty yards to a floating mat of tules, whence I started the hawk a few minutes later. Apparently the duck had not realized its danger, as there was no deviation in its line of flight previous to being struck. Had the hawk struck from above in true falcon style, the prey would have fallen into open water and been lost.

Verdin (*Auriparus flaviceps flaviceps*). Nests of the Verdin were numerous in mesquite-grown gullies in the above locality, among them many that were hardly more than one-third the bulk of the ordinary structure. All these small nests were unlined, with the cavity hardly big enough to hold more than one bird; and they were always

located near others of the regulation size and character. I am unable to learn that these peculiar nests have heretofore been commented upon. To my mind they are *roosting* nests, built for that exclusive purpose, possibly to shelter the male while its mate is brooding.

A mysterious crane (*Grus americana?*). The sonorous notes of cranes were heard on several occasions, always at a great height. In one instance the field-glasses showed five birds in all-dark plumage, circling round and round, in crane fashion, in company with three larger white ones with black, or dark, primaries. As memory serves me, they were identical in appearance with a similar flock seen in northern Illinois in the '80's, and which were doubtless Whooping Cranes. If these were not of that species, what were they? And if they were Whooping Cranes, why in California?

Black-and-White Warbler (*Mniotilta varia*). During the past four years this species has been reported to the writer by local observers a half-dozen times or more, but these reports were never verified by actual specimens until early this last spring, when a bird was taken by Dr. L. B. Bishop near Los Angeles. Later, on April 6, I secured a male at Thermal, in Coachella Valley, feeding among the mesquites. These, I believe, are the second and third recorded captures for southern California. Mrs. L. U. Everhart, of Thermal, reported a specimen there in early March, possibly the same bird secured by me a month later. Apparently this species is becoming less rare in our region, or possibly bird students are making fewer mistakes in identifying the Black-throated Gray species.—L. E. WYMAN, *Los Angeles Museum, Los Angeles, California, June 9, 1922.*

**A Unique Breeding Colony of Least Terns.**—For several years a colony of Least Terns, the western form now called the Brown Least Tern (*Sternula antillarum browni*), had nested on the beach just south of the outskirts of Venice, Los Angeles County. (See Chambers, Condor, x, November, 1908, p. 237.) As this section built up, the terns had a harder and harder time of it trying to raise their young. I have found eggs within twenty feet of an occupied dwelling. Of course, with all the dogs and cats about, as well as curious children, there was not much chance for the poor birds. Finally the terns moved their breeding grounds across a canal, to the very last stretch of sand-dunes, and there nested for several years, but as the town continued to grow in population so did the tern colony decrease. When a bridge was built over the canal, that, of course, meant the end of the colony. The birds struggled along, however, till but a few were left.

On July 8, 1922, while I was hunting over the mud flats, a mile or more back from the sand-dunes, to my surprise I found that the terns had established themselves there in a most unusual sort of place for this species. It was gratifying to find them increased in numbers. They had chosen for their nesting grounds a portion of the dried-up mud flats, a little over a mile from the ocean. They will be in comparative safety there as they are in a posted gun-club preserve quite removed from dogs, cats and dwellings. Several nests were found, no nests at all really, the eggs being simply laid on the hard, dried mud. In some instances, where the mud was soft, the eggs were laid in slight depressions, scratched out by the bird and lined with a few weed stems. At this date sets of two eggs each were seen, but I did not ascertain the stage of incubation. I found two young birds just out of the eggs, one of the usual coloration, the other a light buffy bird. It looked almost yellow beside its nest mate.

The mud on which the birds were nesting, when wet, is of the most tenacious character. On the beaks of the nestlings there were masses of dried mud, accumulated, I suppose, when their bills got wet in being fed by their parents. I cleaned their bills but have been wondering if the mud would interfere with their successful rearing. A nesting site other than sand is a novelty in the life history of the Least Tern. I have seen most of their breeding colonies in southern California and they were all on the sandy beaches a short distance above high tide, or more rarely among the sand-dunes.—CHESTER C. LAMB, *Los Angeles, California, July 8, 1922.*

**The Southward Range of the Santa Cruz Chickadee.**—The southernmost place whence *Penthestes rufescens barlowi* has been recorded heretofore is near the mouth of the Little Sur River, Monterey County (Grinnell, Auk, xxi, 1904, p. 367; Jenkins, Condor, viii, 1906, p. 129). Coniferous forest growths of the humid coast type, such as are

inhabited by this chickadee, are, south of the vicinity of Point Sur, much restricted and far scattered. The last mainland representation of such forest is in the vicinity of Cambria, San Luis Obispo County, some 75 miles south-southeast of Point Sur. There are several square miles of woods there, consisting almost solely of the Monterey Pine (*Pinus radiata*).

Mr. Joseph Dixon was collecting at Cambria, October 27 to November 3, 1918, and found Santa Cruz Chickadees to be not uncommon there; he took five skins (now nos. 30232-30236, Mus. Vert. Zool.) on October 28 and November 1. There, then, is an apparently well established and rather far sequestered colony of the species. Comparison with seasonally similar specimens from the vicinity of Monterey shows the Cambria birds to average paler, nearer white, on the mid-ventral surface. This feature, however, is not pronounced enough or sufficiently uniform to warrant my considering it positively of phylogenetic significance.—J. GRINNELL, *Museum of Vertebrate Zoology, University of California, Berkeley, June 20, 1922.*

**Road-runner Caught in the Act.**—Probably everybody "has heard" that Road-runners eat the eggs and young of quail. Heretofore I have been inclined to class this rumor with the other one about their corralling rattlesnakes with cactus.

On July 9 I was inspecting the quail crop at the Tome Gun Club, near Belen, New Mexico. On the bank of an irrigation ditch, grown to willow bushes with here and there a cottonwood tree, my dog flushed a quail, which looked like an old rooster. At the same time, from the same place, the dog flushed a Road-runner, which hopped into a cottonwood. A careful look showed the Road-runner sitting dead still among thick foliage, with a light-colored object in his bill. I shot him, and the dog retrieved. The dog then pointed under the same tree, another quail flushed (the old hen) and on looking carefully I discovered a whole brood of chicks scattering in the weeds. I then examined the spot where the Road-runner had fallen, and found a dead chick, still limber and warm but un mutilated, matching the live chicks in size, and lying within a foot of the blood. The dead chick was still in the downy stage, with  $\frac{1}{8}$ -inch pin feathers on the wing—smaller than a domestic chick when hatched.

The evidence is practically absolute that the Road-runner was caught in the act. His crop was empty. Possibly by coincidence, each of the five other Road-runners seen during the rest of the day were in the immediate vicinity of quail.—ALDO LEOPOLD, *Albuquerque, New Mexico, July 10, 1922.*

**The Cedar Waxwing in Mexico.**—On February 11 of the present year I was passing through the town of Tehautepec when I was greeted with what to me was a voice from the old home town, the low, subdued hiss of the Cedar Waxwing (*Bombycilla cedrorum*). There were several small flocks of six or eight taking their morning's exercise in a banana grove and apparently feeding there. During the next several days I was passing up the Tequixistlan River and saw several more flocks of about the same size along the trail. In the vicinity of Port Angel on the Pacific coast during the latter part of February and early in March there were a few of these birds scattered here and there. On April 16, while spending the day in Chapultepec Park in Mexico City, I was again pleasantly surprised to hear these same notes. There was a flock of twenty-nine birds circling around and occasionally settling in the pines, from which they flew down into the grass where they were foraging. Just a week later I was in the city of Monterey in the state of Nuevo Leon in the northern part of Mexico, where again I met a small flock of Cedar Waxwings.

Tehautepec is in the southern part of Mexico, is but a hundred feet or so above sea-level, is very hot, and has an abundance of irrigated tropical vegetation. The Tequixistlan basin is under about the same conditions, but without the irrigated areas; Port Angel at this season is dry and the trees are for the most part bare. In all of these places the inhabitants are Indians. Mexico City is at 7600 feet elevation, and has a cool climate; its vegetation is of the Oregon or northern California type. In Chapultepec Park, the ancient Aztec kings, the subsequent Spanish conquerors, and the following Mexican presidents, have had their palaces. Monterey is but a few hundred feet above the sea, is very hot, and has the floral and faunal aspect, as well as the climate, of

southwest Texas. All of which goes to show that the Cedar Waxwing in winter shows little choice among different climates and surroundings.—R. H. PALMER, *Instituto Geologico, Mexico, D. F., June 17, 1922.*

**Some Birds Recently Observed in Southern California.**—The past year, during both the fall and spring migrations, the writer has hunted assiduously in many favorable spots in southern California for the different waders. During these hunts a careful lookout was kept for two of our rarest shore bird visitants, the Ruddy Turnstone (*Arenaria interpres morinella*) and the Surf Bird. No Surf Birds were seen, but seven Ruddy Turnstones were observed. Near Point Mugu, Ventura County, on August 27, 1921, two were seen, and one of them, a male, was secured. Five were seen on the tide flats near Wilmington, Los Angeles County, on May 7, 1922, and two of these were collected. Both were females, one a young bird and the other in nearly full breeding plumage. There are quite a few instances of occurrences of this turnstone during the fall migration, but no spring records from the southern California mainland, though it was met with on San Nicolas Island from March 30 to May 11, 1910 (Willett, *Pac. Coast Avifauna*, 7, 1912, p. 41).

On August 21, 1921, on the mud flats near Wilmington, there were many large flocks of Northern Phalaropes (*Lobipes lobatus*) (later in the fall many *Phalaropus fulicarius* also), but I was indeed surprised to see a large flock of Wilson Phalarope (*Steganopus tricolor*) busily feeding in the mud near the water's edge. Unlike the Northern Phalaropes, which were swimming constantly, they fed on the banks, though occasionally running into the shallow water. I estimated the flock of Wilson Phalaropes to be somewhat over two hundred birds. They kept in a compact mass and it was difficult to count them, though they were very tame and unsuspicious. All appeared to be in winter plumage, as were the specimens collected. The place was visited several times afterwards at intervals of a few days each, but the birds were not seen again.

On July 4, 1922, three Black-bellied Plover (*Squatarola squatarola*), all in winter plumage, or perhaps young birds, were observed near Venice, feeding among a mixed flock of Long-billed Dowitchers, Least Sandpipers, Greater Yellow-legs, Black-necked Stilts, Hudsonian Curlews, and Marbled Godwits. Were these birds very early fall migrants, very late spring migrants, or had they been there since the past winter?

On February 19, 1922, I took a female Eastern Fox Sparrow (*Passerella iliaca iliaca*) at the mouth of Verdugo Canyon, near Glendale, Los Angeles County. It is quite reddish but not to such an extent as the typical bird from the east.

A short trip to Buena Vista Lake, Kern County, was made on June 11, 1922, in company with Mr. Luther Little. What impressed us most was the irregular occurrence of some of the breeding birds, comparing different years. For several years the water of the lake has been very low, but now, the copious rains of last winter have made it higher than for many previous years. Last season, large numbers of White Pelicans (*Pelecanus erythrorhynchos*) were present all summer, but did not nest; the water was not high enough to form their nesting island and it seems that these birds must have an island or they will not nest. This year, although their island was formed, there were but few Pelicans around and those were not nesting. The reason may have been that this year there are only a few fish left of the myriads that were there formerly.

Western Grebes (*Aechmophorus occidentalis*) were nesting abundantly. Last year none nested (in fact only one was seen), while the year before, Mr. Adriaan van Rossem tells me they were breeding commonly.

White-faced Glossy Ibis (*Plegadis guarauna*) were present in a large breeding colony. This is the first time, after several visits to the lake, that I have found this species nesting there. In the same way, Avocets (*Recurvirostra americana*) breed irregularly; but Black-necked Stilts (*Himantopus mexicanus*) are more constant.—CHESTER C. LAMB, *Los Angeles, California, July 8, 1922.*

**Vaux Swift in Migration.**—On April 29, 1922, about 7 P. M., the largest flock of Vaux Swift (*Chaetura vauxi*) I have ever seen or, in fact, heard of, circled over my house several times. By careful estimate I judged the number to be very nearly six

hundred individuals. My observations of the Vaux Swift have heretofore been made only within its breeding range; while this is my first observance of a migrating flock, such an immense gathering of this rather rare wilderness dweller is no doubt a most unusual occurrence.—H. H. SHELDON, *Santa Barbara, California, June 15, 1922.*

**Nesting of the Spotted Sandpiper on the Russian River.**—As the Spotted Sandpiper (*Actitis macularia*) breeds but sparingly and locally along the larger streams of the coast belt and is thought to be a rare species in the coast region north of Santa Barbara (Grinnell, *Distributional List of the Birds of California*, p. 53; Grinnell, Bryant and Storer, *Game Birds of California*, pp. 431-437) a definite instance of its breeding on the Russian River may be of sufficient interest to record. During the period May 29, 1922, to June 2, 1922, I spent a few hours each day observing birds along the Russian River between Hilton and Cosmo in Sonoma County, California, and frequently saw one and sometimes two adult birds of this species flying along the river, always very close to the surface of the water and following the course of the river. These birds flew in the characteristic manner of this species, that is, without raising the wings above the back. They did not fly at all in the manner of sandpipers commonly seen along the shores of San Francisco Bay. Parties of people in boats or canoes did not disturb the course of flight except to cause the birds to swerve to avoid the obstacles by a few yards only.

Again during the period July 20, 1922, to July 26, 1922, I visited the same territory and saw the adult birds and two very small young on a pebbly beach on the right bank of the river about opposite Cosmo. The adult birds were seen flying as before but the young birds could not be induced to fly, although they ran very well and were very apt in hiding in the brush along the bank of the river and in concealing themselves among the stones. The adult birds exhibited the habit of constantly tilting or bobbing the tail, and symptoms of the same trait were slightly noticeable in the young. The food procured apparently consisted of insects, in pursuing which the tilting or bobbing of the tail was greatly accelerated.

I visited this particular beach every day on my last trip, except the first and last days, and found the birds there each time. Upon my approach one of the adult birds began calling and the two tiny young would scurry off along the shore until they found a hiding place. The opportunities I had of seeing the birds repeatedly at close range, the characteristic call note and the habit of bobbing or tilting the tail, leave me without doubt as to the identity of the birds. I also took the precaution of looking at skins in the Museum of Vertebrate Zoology. The fact that the young birds were not yet able to fly is strong evidence that they were hatched not far from the point where seen, although it is said that adult birds of this species have been known to move their young to places of safety. One of the adult birds was always near the young, gave warnings of my approach, displayed evident anxiety when I was about, and when forced to fly returned to near the point of departure, so that there seems no inference but that I was observing a pair of adults and their young.—CLAUDE GIGNOUX, *Berkeley, California, August 6, 1922.*

**Additional Capture of a Black-and-White Warbler in California.**—On October 11, 1918, at a point near the seacoast about seven miles north of Piedras Blancas, San Luis Obispo County, California, I shot an immature female *Mniotilta varia*. The bird was sighted at early dusk working, nuthatch-fashion, around the base of a cottonwood and among some nearby driftwood. Although the place was shaded I could see with distinctness the contrasting black and white stripes on the head and back of the bird. The geographic location, more exactly, was just to the right of the road-crossing to the Evans ranch, in the bottom of the canyon of San Carpoforo (locally "San Carpojo") Creek and about half a mile from the ocean shore.

That the specimen in question (now no. 30083, Mus. Vert. Zool.) was a "bird of the year" was shown conclusively by the condition of the skull. The bird was very fat. It was in complete first-winter plumage save for the tail; only two of the rectrices (evidently belonging to the juvenal plumage) were of full length, the rest being only about half-way emerged from their sheaths. This condition was probably due to some accident, not being part of the regular molt program.

As to measurements, the bird is small: wing 61.8 mm., exposed culmen 11.5, tarsus 16.5. Ridgway's smallest wing-length for a female of the species is 65 mm. (Birds N. and Mid. Amer., II, 1902, p. 433). It would be useful to know the measurements of other Pacific Coast examples, to the end that the source of the birds wintering with us might be learned. As far as known now, the Black-and-White Warbler does not breed in either Alaska or British Columbia; it looks as though they must come to us across-lots from some area to the eastward or northeastward.

The present record is the seventh for the capture of *Mniotilta varia* in California; that is, the present specimen is the 7th taken; two of the earlier captures were recorded two or more times each. At least four other individuals have been reported as seen. Of course this is an unusually easy bird to identify in the field, by reason both of its conspicuous markings and its peculiar mannerisms. But even so, probably but very few of the total number of Black-and-White Warblers visiting California each year come to human notice.

As suggested by Mr. L. E. Wyman on a preceding page, the frequency with which this bird is observed in California seems to be increasing of late years. This may be due, as he says, to an actual increase in the aggregate number of the birds visiting the state annually. Of course some fluctuations are to be expected, though hardly, I should think, a continual augmentation. More likely, in my mind, the increasing number of records is due directly to the increase in the number and the alertness of ornithological observers.—J. GRINNELL, *Museum of Vertebrate Zoology, University of California, Berkeley, June 19, 1922.*

## EDITORIAL NOTES AND NEWS

The annual meeting of the American Ornithologists' Union for 1922, being the fortieth stated meeting, will be held in Chicago, Illinois, the week beginning October 23. The public sessions will be held October 24, 25, and 26 in the new building of the Field Museum of Natural History, situated in Grant Park on the shore of Lake Michigan and within sight and walking distance of the business district and many of the best hotels. Since this will be the first stated meeting of the Union to be held west of the Atlantic seaboard, it is hoped that it may be widely representative of the whole country, with a good attendance from both East and West. The usual participants at eastern meetings, including the well known ornithologists of New York, Boston, Philadelphia and Washington, will be well represented; and it will be a particularly happy occasion if a good delegation is present from the Pacific Coast. From Chicago itself and from the states of the Middle West and South a large attendance is confidently expected. It is proposed to hold an exhibition of bird paintings following the example so successfully set at the Washington meeting in 1918. This feature will be especially developed and doubtless will be greatly appreciated by those who have not previously had opportunity to see a large and varied collection of original paintings of birds. Besides pictures to be exhibited by the artists themselves, it is hoped that pictures

owned by various members of the Union will be loaned for the occasion under terms which will entail no expense or risk to the owners. Correspondence in regard to this is invited by the Chairman of the local committee. The committee of arrangements consists of Wilfred H. Osgood (chairman), Percival B. Coffin, Ruthven Deane, O. M. Schantz, and R. M. Strong, together with the President and Secretary of the A. O. U., ex-officio.

Mr. A. C. Bent, of Taunton, Massachusetts, is at work upon the fifth volume of his Life Histories, relating to the ducks, geese and swans. He will be glad of contributions of information relative thereto and likely to be additional to the matter already accumulated.

The list of the Board of Governors of the Cooper Club which appeared in the last issue of THE CONDOR omitted, by inadvertence, the names of Donald R. Dickey, W. B. Judson, and Curtis Wright. These should have been included.

A good deal is being said in the daily press about an alleged hybrid between turkeys and fowls, which goes under the name "turkhens" or "turkens". A fertile hybrid between so dis-related birds would be rather surprising. The evidence at hand indicates

that the "turken" is in no sense a hybrid but is a large, vigorous strain of fowl, long known in central Europe, and only recently imported into the United States.

Mr. Joseph Mailliard, of the California Academy of Sciences, is carrying on field-work this fall in the Feather River district.

Mr. Harry S. Swarth, of the California Museum of Vertebrate Zoology, is spending the autumn months in north-central Arizona, collecting birds and mammals.

Dr. Louis B. Bishop has spent the summer at Carmel, where he carried on field work with the birds as demands upon his time in other connections permitted. Dr. Bishop has made some interesting discoveries which he will report shortly in *THE CONDOR*.

Mr. and Mrs. Charles W. Michael, permanently residents in the Yosemite Valley, California, have been keeping daily record of the birds they see there, and sending these records month by month for permanent deposit in the California Museum of Vertebrate Zoology. Their reports, complete since June, 1920, are annotated species by species and also summarized in tabular form, day by day. They thus show in readily understood manner the seasonal movements of the birds at a very interesting station where both altitudinal and latitudinal migrations are in evidence.

The Sixteenth Annual Report of the California Audubon Society (issued June 28, 1922) is before us. It consists mainly of the report of the Secretary, Miss Helen S. Pratt, and this is written in vivacious vein, optimistic, and for the most part free from extreme "protectionist" sentiment. A profoundly true aphorism set forth by the Secretary in regard to the Barbour bill (creating the Roosevelt-Sequoia National Park in the southern Sierra Nevada) is this: "National parks are NATIONAL MUSEUMS. Their purpose is to preserve forever, in their original untouched condition, certain few, small, widely-separated examples of the American Wilderness of the pioneer and the frontiersman; of the works and processes of Nature unblemished by men's hands; of our native wild animals living natural lives in the natural homes of their ancestors."

#### MINUTES OF COOPER CLUB MEETINGS

##### SOUTHERN DIVISION

APRIL.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held at the Los Angeles Museum at 8 P. M., April 26, 1922. Dr. Rich had the chair, with others present as follows: Mesdames Anthony, Fargo, Law, Mil-

ler, Mix, Schneider, Warmer; Miss Burnell and Miss Pratt; Messrs. Appleton, Barnes, Bishop, Chambers, Colburn, Hanaford, Hilton, Howell, King, Law, Lamb, Little, Miller, Pierce, Robertson, Warmer and Wyman. Among the visitors were Mesdames Bishop and Wyman; Misses Evans, Fargo, Wetherell and Wilcox.

Minutes of the previous meeting were read and approved, while those of the Northern Division were read by title only. Applications for membership were: Mrs. H. F. Thompson, Los Angeles; Ella A. Evans, Exeter; and Charles Sapp, Long Beach, all by Charles A. Warmer. Mrs. Silkman E. Hyde, Regina, Idaho; Elmer Langevin, Crookston, Minn.; and Carl H. Bryant, Atascadero, by W. Lee Chambers. Miss Nellie May Brown, Los Angeles, by A. van Rossem. Robert R. McLean, San Diego, by C. S. Sharp. Mrs. L. U. Everhart, Thermal, by L. E. Wyman. The Northern Division sent the names of Archibald W. Bell and Helen Genevieve Corwin, of Berkeley.

A letter from Mr. W. L. Dawson inviting the club members to attend the formal opening of the new building of the Museum of Comparative Oology was read by the secretary. Formal business ended, various members who had recently visited the desert spoke on their experiences and observations. The session closed with the usual general discussion, and inspection of a series of skins and nests collected by the secretary in Imperial and Coachella valleys. Adjourned.—L. E. WYMAN, *Secretary*.

MAY.—The regular meeting of the Southern Division was held at the Los Angeles Museum, 8 P. M., May 25, 1922. Dr. Rich presided, with others in attendance as follows: Mrs. Law, Miss Miller, Miss Potter; Messrs. Barnes, Bishop, Chambers, Hanaford, Hilton, Holland, Howell, King, Lamb, Law, Morcom, Reis and Wyman. Mrs. Lamb, Miss Swarth, Mrs. Wyman and Mr. Greene were visitors.

Minutes of the previous meeting were read and approved, followed by reading of those of the Northern Division. Mr. Chambers presented for membership the names of Rev. M. Lee, Tulare, and Charles Ketchum Averill, Bridgeport, Conn. Franklin J. Smith sponsored Bertram O. Betterley, Eureka. The Northern Division sent the name of Vernon L. Tenney, Berkeley. Mr. Law spoke informally on the latest results of his bird-banding operations, the subject proving even more interesting than formerly. A tray of gull skins representing at least one new and unrecorded species for



this coast, received general attention. Dr. Bishop described certain plumage features not shown in the specimens at hand. Adjourned.—L. E. WYMAN, *Secretary*.

JUNE.—The regular monthly meeting of the Southern Division was held at the Los Angeles Museum, June 29, 1922, at 8 p. m. In the absence of both presiding officers, Mr. Howard Robertson was acclaimed chairman for the evening. Other members were present as follows: Messrs. Barnes, Chambers, Hanaford, Howell, King, Lamb, Law, Marshall and Wyman; Mrs. Anthony, Mrs. Schneider and Miss Pratt. Among the visitors were Mesdames Joy, Lamb and Wyman, and Mr. Allen.

Minutes of the May meeting were read and approved. Applications for membership were: James H. Langstroth, Silver City, New Mexico, by R. T. Kellogg; Ella Haines Ellis, Los Angeles, by Miss Miller; W. I. Allan, Lamanda Park, by J. Eugene Law; Mrs. R. W. Fenn, Lindsay, by Miss Pratt; William H. Ball, Eureka, by Franklin J. Smith; James S. Trehwella, M. D., Montebello, and Paul E. Simons, M. D., Riverside, by Dr. Warmer. The Northern Division sent the name of John D. Patterson, Patterson.

The subject of bird-banding was again a lively topic. Mr. Law moved that a committee be organized to be known as the Bird Banding Chapter of the Southern Division of the Cooper Ornithological Club, whose purpose shall be to stimulate interest in the bird banding movement. It shall have a chairman and a secretary, the former to be appointed by the president of the Southern Division and the latter to be named by such chairman. The committee shall hold meetings at such times and places as it may choose, not less than once a month, and shall make frequent reports to the Southern Division of its progress and activities. Any member of the Cooper Club who desires may become a member of this committee by signifying his desire so to do and paying 25 cents per annum to the secretary of the committee. Motion seconded by Mr. Barnes and carried unanimously, whereupon Mr. Robertson appointed Mr. Law chairman of said committee. A half-hour was spent in general discussion and inspection of a tray of grosbeaks and orioles. Adjourned.—L. E. WYMAN, *Secretary*.

#### NORTHERN DIVISION

MAY.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held in the usual place on May

25. Mr. Swarth presided, and the following members and friends were in attendance: Mesdames Allen, Bennet, Culver, Grinnell, Mead, Reygadas, and Wythe; Messrs. Bryant, Bunker, Cooper, Evermann, Grinnell, W. Grinnell, Miller, Swarth and Torrey. Visitors present were Mrs. Edmonds, Mrs. Kerr, and Mr. Thomas.

The April minutes were read and approved, after which the name of Mr. John D. Patterson, Patterson, California, was presented by Mr. J. Grinnell. The resignation of Mr. Leverett Mills Loomis was presented and was accepted on motion of Mr. Cooper, seconded by Miss Culver. A communication from Miss Van Gaasbeck reported observations at Lake Merritt Park, and Dr. Grinnell reported the discovery by Mr. LaJeunesse of the eggs of the Cowbird in the nests of the Song Sparrow, Willow Goldfinch and Pileolated Warbler near Irvington. The program of the evening consisted of a paper given by Mr. R. C. Miller on "Various Theories of Soaring Flight." Adjourned.—AMELIA S. ALLEN, *Secretary*.

JUNE.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology at eight o'clock on June 22, 1922.

President Swarth presided. Other members present were: Mesdames Allen, Bamford, Bogle, Grinnell, Kelly, Reygadas, and Schlesinger; Misses Culver, Flinn, Lindemann, Pringle, Thomson, and Van Gaasbeck; Messrs. Bunker, Carriger, Dixon, Grinnell, Kloss, LaJeunesse, Miller, and Storer. Visitors present were Mrs. Lathrop, Mr. and Mrs. Schenck, and Mr. Blickensderfer. The minutes of the preceding meeting were read and approved, and the April and May minutes of the Southern Division were read. Applications were received from Mr. Frank Bacon, Berkeley, sponsored by H. C. Bryant, and Mr. Frank O. Adams, Vancouver, sponsored by Joseph Mailliard.

Mr. LaJeunesse reported the finding of nine Cow-bird eggs this season in nests of small birds near Irvington. On motion of Dr. Grinnell, seconded by Mrs. Allen, Mr. LaJeunesse and Mr. Carriger were authorized by the club to dispose of the offending Cow-birds. Dr. Grinnell then presented a paper entitled "An Inquiry into the Supposed Decrease of Bird-life in California". After discussion, Mr. Blickensderfer was introduced and showed his wonderful photographs of Colorado birds. Adjourned.—AMELIA S. ALLEN, *Secretary*.

**For Sale, Exchange and Want Column.**—Any Cooper Club member is entitled to one advertising notice in each issue free. Notices of over ten lines will be charged for at the rate of 15 cents per line. For this department, address W. LEE CHAMBERS, Altadena, Los Angeles County, California.

WANTED, for cash or exchange—The Auk, vol. 3, no. 4, vol. 6, no. 1; A. O. U. Checklist N. A. Birds, 3rd ed.; The Osprey, vol. 1, nos. 2, 4, 5, 6, 7, 9, vol. 2, no. 3, any after 9, vol. 3, any or all numbers, vol. 4, any after 9, vol. 5, nos. 1, 8, vol. 6, any number except 2.—J. E. HALLINEN, Cooperton, Oklahoma.

THE GAME BIRDS OF CALIFORNIA, by Grinnell, Bryant and Storer; large 8vo, pp. x+642, 16 colored plates, 94 figures in text; cloth bound. A comprehensive work, including full information down to 1917, compiled with regard to the needs of the nature-lover, sportsman, and serious ornithologist; \$6.00 net.—O. M. WASHBURN, Manager, University of California Press, Berkeley, California.

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ASSISTANT CURATOR WANTED—Applications are invited for the position of Assistant Curator in the California Museum of Vertebrate Zoology. Candidate should have some knowledge of systematic ornithology and mammalogy; he should have a clear and accurate style of handwriting, so as to do labelling and cataloguing; he must be ready and willing to meet freely and explicitly the desires of his employer in regard to methods of carrying on his work (yet he must be possessed of initiative and energy). The initial salary for a person of acceptable qualifications is twelve hundred dollars per year. Correspond with: THE DIRECTOR, Museum of Vertebrate Zoology, University of California, Berkeley, California.

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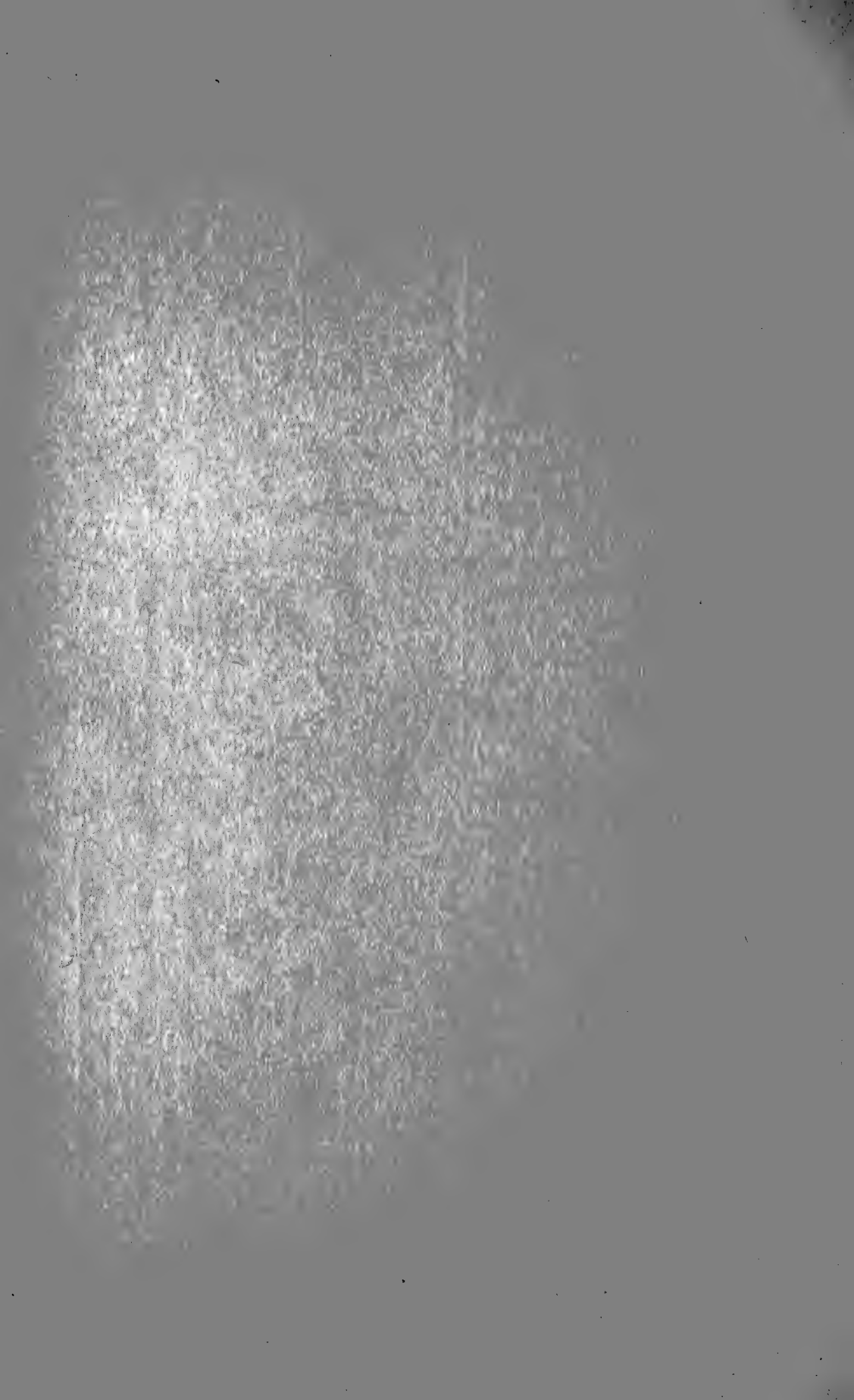
### PACIFIC COAST AVIFAUNA

No. 5. A Bibliography of California Ornithology, by Joseph Grinnell. 1909. 166 pp. Price \$1.50 post paid.

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No. 7. Birds of the Pacific Slope of Southern California, by George Willett. 1912. 122 pp. Price \$1.50 post paid.

Contains extensive and accurate accounts of the local distribution, nesting, and migration of the 377 species and subspecies of birds found on the Pacific slope of southern California, from San Luis Obispo County to the Mexican line. Anyone interested in the birds of southern California will have constant need of this publication, as a check upon his own observations.



# THE **C**ONDOR

A Magazine of Western  
Ornithology

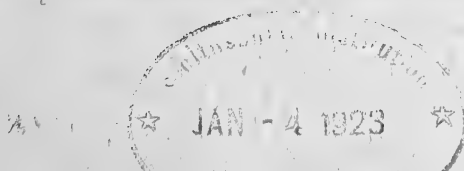


Volume XXIV    November-December, 1922    Number 6



W.K.F.

COOPER ORNITHOLOGICAL CLUB



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Published Bi-Monthly by the Cooper Ornithological Club

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Entered as second-class matter January 25, 1922, at the post-office at Pasadena, California, under Act of Congress of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized January 5, 1921.

Issued from the Office of THE CONDOR, 770 South Pasadena Avenue, Pasadena, California

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## SUBSCRIPTION RATES

Two Dollars per Year in the United States, payable in advance.

Forty Cents the single copy.

Two Dollars and Twenty-five Cents per Year in all other countries in the International Postal Union.

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Two Dollars per year for members residing in the United States.

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Manuscripts for publication should be sent to the Editor, J. GRINNELL, Museum of Vertebrate Zoology, University of California, Berkeley, California.

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Issued December 19, 1922

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## THE DEVELOPMENT OF YOUNG COSTA HUMMINGBIRDS

By ROBERT S. WOODS

WITH FOUR PHOTOS BY THE AUTHOR

WHILE following the progress of a pair of young Costa Hummingbirds (*Calypte costae*) at Azusa, California, in May, 1921, I was impressed with their slow growth as compared with that of the smaller passerine birds; so, on finding another nest, on May 18, 1922, I kept as accurate a record as possible of their development.

This latter nest (figure 46) was located about four feet from the ground on a lower limb of an avocado tree some ten feet in height. It contained the usual two eggs when discovered and for two weeks thereafter. On the morning of June 1 there appeared one black, grub-like young hummer, with stubby, triangular bill and a double row of yellowish down along the back, the body being otherwise bare. The afternoon of the following day the second egg was hatched. The egg shells were not removed from the nest. The bill of the newly hatched hummingbird is a little longer than the width at the base, light in color, and abruptly differentiated from the head, which is comparatively broad and straight across the front. The abdomen is reddish brown, and the sides as well as the upper parts are black.

On the morning of June 7 pin-feathers had appeared on the older bird and by the afternoon of June 8 on the younger also. The bills were longer by this time and more tapering from the head and were mainly dark colored. On the 10th the older one had assumed the peculiar position shown in figure 47, with bill pointing straight up. This attitude is apparently made necessary by the fact that the young hummer is too long for the nest, but not yet large enough to hold its head above the edge. On the 13th the feathers were becoming soft and fluffy-looking and the older bird could open its eyes, at least partly. By the 15th both birds were able to sit up and stretch their wings and view the surroundings.

When inspected on June 17 the older hummer appeared fully feathered except for the shortness of tail and wing feathers. The bill was about the length of the head and was still straight and conical in outline. On the evening of the 21st the older bird seemed alert and ready to leave the nest. Upon moving the limb on which the nest was placed both birds suddenly flew to neighboring trees thirty feet away. The younger, though it could fly from one tree to another,

had difficulty in securing a foothold and generally dropped to the ground. It made no attempt to escape when picked up and when finally replaced in the nest, as an experiment, it settled itself contentedly and remained there for about 24 hours, leaving when I approached the nest the next evening. At that time its flight was stronger and it seemed well able to care for itself.

For purposes of comparison I noted the approximate time spent in the nest by the young of several common birds nesting at about this same time. These were the House Finch (five nests), Green-backed Goldfinch, Western Lark Sparrow, Anthony Brown Towhee (two nests) and Western Mockingbird. The length of time ranged from 10 to 16 days, the longest in the case of the Mockingbird and perhaps one of the Linnets, the shortest for the Lark Sparrow and Towhee, which probably left their nests rather prematurely. These figures are

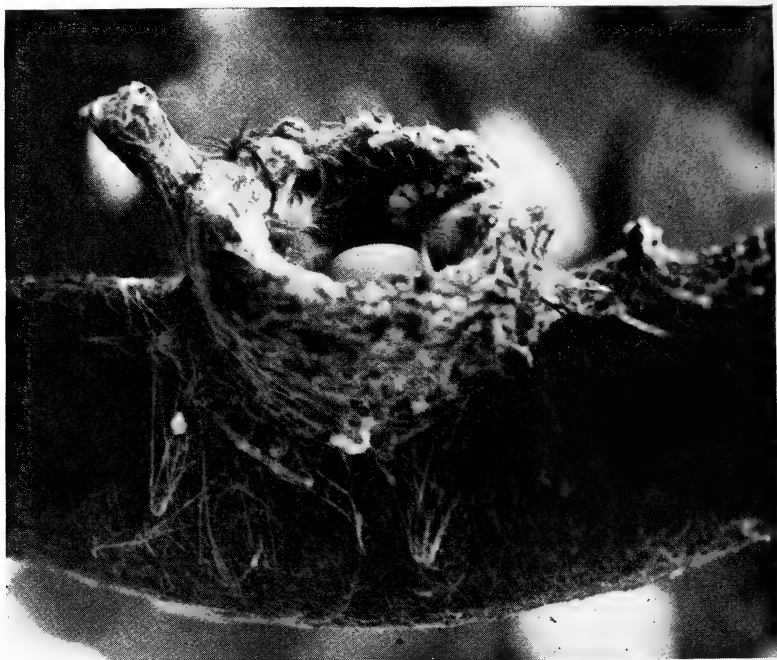


Fig. 46. NEST (NO. 2) OF COSTA HUMMINGBIRD. AZUSA, CALIFORNIA, MAY 19, 1922.

not intended to be accurate, but they are in all cases considerably less than the 20 days which the Hummingbirds required. The corresponding period for the brood observed the previous year was not determined exactly, but I believe it to have been 22 or 23 days.

On June 2, 1922, I found another Costa Hummingbird building a nest near the end of a long horizontal limb of a good-sized avocado tree, at a height of about five feet from the ground. Her method was first to alight in the nest, then place the material under her (figure 48) and compact it by treading with the feet and turning about. Material for the outside of the nest was placed while hovering or while perched on a branch. On one occasion after leaving the nest the bird flew up to a twig a few feet above, whereupon I was surprised to see another hummer alight in the nest and rearrange some of the material, after-



wards sitting there for some time until the presumably rightful owner presently darted at the intruder and drove her away. The nest was composed largely of small achenes bearing soft pappus. Other items noted were fibers, minute leaves, feathers and a short piece of string, the whole bound securely to the branch with cobwebs.

One egg was found in this nest on the afternoon of June 6 and another the next morning, this before the walls of the nest were entirely filled in. The nest was by no means considered complete with the laying of the eggs, but additional material was constantly brought, so that at times the eggs were almost concealed by it. After 14 or 15 days' incubation the bird disappeared from the nest and was seen no more, at least in that vicinity.

The behavior of the hummingbird on the nest is directly opposite to that of many other birds. It does not remain motionless in the hope of escaping notice,



Fig. 47. YOUNG COSTA HUMMINGBIRDS IN NEST (NO. 1). AZUSA, MAY 18, 1921.

but often flies when approached within 30 or 40 feet. If one stands quietly even at a much less distance it will soon return, to leave again at any sudden motion. Thus the idea of concealment of the location of its nest does not enter into its thoughts or instincts. Those nests which I have found have been so situated that a clear outlook could be obtained in at least two directions. The hummingbird while incubating seems to require but little time for procuring food, as I have seldom found them absent from their eggs, and of course the female is not relieved by her mate, as is the case with so many birds, nor is she fed by him as are the female finches. The owner of the nest shown in figure 49 was more shy than usual and it was necessary in securing the photograph to remain at some distance, operating the shutter with a thread while reflecting light on the sub-



Fig. 48. FEMALE COSTA HUMMINGBIRD ARRANGING NEST MATERIAL. NEST NO. 3; AZUSA, JUNE 8, 1922.



Fig. 49. COSTA HUMMINGBIRD FEEDING YOUNG. NEST NO. 2; AZUSA, JUNE 16, 1922.

ject by means of a mirror. She had no fear of the camera, however, and once returned to the nest while my head was under the focusing cloth.

In no case have I seen a male hummingbird in the vicinity of the nest or in any way showing interest in the matter. In fact, all the males had apparently started on their southward migration by the middle of June, 1922, or soon after the eggs had been laid in the last nest and while the young in the second nest were no more than half grown. None was seen earlier than May, probably on account of the lateness of the season, so their stay was very short this year. By July 1 the females and young were also noticeably scarcer. If the owner of the third nest had remained to hatch out and rear her young she would probably have been detained beyond the usual time for migrating.

Despite the small size of the hummingbirds, and of the Costa in particular, the eggs and young as well as the adults must be peculiarly immune to depredations of natural enemies, as evidenced by their survival in the face of several unfavorable conditions brought out in the foregoing notes and which may be enumerated as follows: First, only two eggs are laid and presumably only one brood raised each year by the Costa Hummingbird; second, the period during which the young are confined to the nest is from 50 percent to 100 percent greater than in the case of the smaller passerine species; third, the young are entirely dependent upon the female parent for sustenance. That the hummingbirds are able to maintain their numbers under these handicaps can but increase our admiration for these tiny but highly specialized and intelligent creatures.

*Los Angeles, California, August 21, 1922.*

## EVIDENCE OF MUSICAL "TASTE" IN THE BROWN TOWHEE

By RICHARD HUNT

TO BEGIN WITH I wish to establish in the minds of those readers who do not happen to be familiar with the Brown Towhee (*Pipilo crissalis crissalis*) a working idea of this bird's song. The song is normally a staccato series of sharp metallic clinks with intervals constantly decreasing so as to carry the utterance into a thrill or vibration toward the end. The "shape" can be easily imagined by thinking of some resilient object, say a golf ball, dropped on a hard surface and allowed to bounce itself motionless, thus: *tip——tip——tip—ip-prrrrr*. A very good idea of the timbre can be gained by striking together two silver dollars so as to produce a smart and rather "live" ring.

Except in two instances, which I am about to describe, I never was struck by any signs of instability in the Brown Towhee's song. On the contrary I had come to consider the song so stereotyped that it would be absurd to expect any marked individual divergences. "Brownie" had become in my mind a dull fellow, musically, particularly devoid of originality. It was refreshing, therefore, to hear first one and then another individual of the species sing a song that was decidedly "off color"—not, mind you, in any trivial matter of mechanics due to inexperience or adventitious defect of execution, but in what I may call subject matter. Both of these "aberrant" singers that by good fortune came to my notice departed from the type utterance of their race by *adding* some *brand*

new notes at the end of the common song; and these brand new notes were unmistakably imitated from other species.

I heard the first of these two abnormal songs near Chalk Peak, in the Santa Lucia Mountains, Monterey County, California, June 22, 1919. Over and over again the bird sang the typical "bouncing" song of the species, *plus* a low bubbling warble of four syllables. The warble was so nearly identical with part of the song of the Western House Wren (*Troglodytes aedon parkmani*) as to be, in itself, mistakable for it. The song ran: *tip—tip—tip—ip-prrrrr, chreh-chreh-chreh-chreh*. This song struck me at the time as a "freak", but I made a careful record of it, nevertheless, and on my return home filed the record away.

This "freak" song was given new meaning when, three years later, namely, on May 2, 1922, I heard, in the Botanical Gardens of the University of California, the following: *tip—tip—tip—ip-prrrrr, chirp-chirp*. The added feature this time was a perfectly good chirp of the Linnet (*Carpodacus mexicanus frontalis*). The towhee sang this song repeatedly with no deviation except that occasionally it used a single instead of a double chirp.

The thing that seems to me significant about this business is that these two "off" songs, coming by chance to my attention, and occurring quite independently of each other in point of space and time, should be so remarkably alike in their "offness". I can hardly escape the belief that the observed facts indicate a racial, rather than an individual tendency at work. Chauncey J. Hawkins, discussing the evolution of bird song (1922, p. 53) asserts that "when we turn from the study of individuals to the group of individuals which has assumed the rank of subspecies then divergences are perpetuated." He mentions some typical evolved differences of utterance between subspecies. The theory is that they exist as fixed differences now, because the original tendency to departure from the type was uniformly expressed by the individuals of a *group*. The freak or exceptional songs "are not perpetuated in the life of the species nor in subspecies. They are lost with the individuals." I am proceeding on the not too unreasonable assumption that my two aberrant Brown Towhees represent a "group." It seems not improbable that, since two individuals with similarly divergent songs have come to my personal attention, there must be others which have not. I base my assumption on the fact that the two songs are alike, not in one respect (which might be accidental) but in several respects, which I shall mention presently. This points to something deeper and more lasting than individual eccentricity.

We know that a Brown Towhee hatched say in Humboldt County behaves, looks, and is "like" another Brown Towhee hatched in Monterey County. It is three hundred miles from Cuddeback to Jolon, but the Brown Towhees of each locality are more nearly alike than any two randomly chosen humans of the same race. Why? Because both individuals—though they, nor their parents, never have come in contact—partake of the specific essence of *Pipilo crissalis crissalis*. Nothing has gone from one to the other, or even from any ancestral *Pipilo* to them. Yet they are what the ancestral *Pipilo* is, in size, shape, color, mannerisms, voice. And, since they are alike in these essentials why should they differ in the essential of song-improvement? "Germ-cells", says Charles Otis Whitman (1919, p. 179), "behave alike in development, not because anything is transmitted to them, but because they represent identical material and constitu-

tion, and are exposed to essentially like environmental conditions." Is not the manner of song modification as much "identical material" of the Brown Towhee as is his brown coat or his mincing step as he forages in the grass? Is it not as natural that two individuals of a species should behave alike in improving as in possessing a song? The facts impressing me as significant because of their appearance in both of our towhee songs, are as follows:

1. The fact of elaboration.
2. The fact of elaboration through imitation.
3. The fact of elaboration through adding the imitated syllables at the end.
4. The fact of the comparative musical quality of the imitated syllables (as contrasted with the hard metallic quality of the notes in the "bouncing" song).

Certain ideas, of not too speculative a character, I hope, to be of some value, occur to me in connection with each of these four points.

1. *The fact of elaboration.*—It would seem that all birds who possess songs possess a tendency to elaborate or improve their songs; that is, to render more perfect their songs in the number, kind, and arrangement of notes. The finest singers among birds (so considered from the human point of view, and so too in actuality, I believe) are the producers of comparatively prolonged and complex musical effects. The evolution of bird song evidently proceeds from simplicity to complexity.

The simplest songs are those sung in short set form—running automatically in pre-established grooves. Within this definition, the simplest are those containing only one kind of sound. Finally, these two essentials being complied with, the simplest are those in which the one kind of sound involved is derived from the call- or alarm-note of the singer. Charles A. Witchell describes (1896, pp. 49-50) the songs of some fifteen birds, and remarks (p. 53), "In all the above-mentioned British species, and in some of their allies, which represent many avian races, the males court the females partly by the repetition of notes which we observe to be employed in other circumstances as call-notes; and in some species these notes are repeated so rapidly that a phrase is constructed. But some species have never advanced beyond the mere repetition of their call-notes." He expresses the belief (p. 58) that "songs were, at first, mere repetitions of call-notes, or possibly of defiance-cries, which have since been more rapidly uttered and varied, with the result that novel strains have been slowly developed." Among American birds two species occur to me off-hand as possessing songs more or less of this type. One is the Linnet, whose zig-zag, twit-tery warble is found on analysis to be composed partly of the call-note, or chirp, of the species. The other is the object of our present study, the Brown Towhee, whose normal song is composed wholly of repetitions of its alarm-note.

The typical "bouncing" song of the Brown Towhee, though according to our definition very simple, is doubtless even at that an elaboration of something still more simple, which in turn we must trace back through imperceptible stages to its humble origin, the alarm-note. The alarm-note (in the Brown Towhee as in other song-birds) must have existed before the song. Without bothering ourselves here about the origin of alarm- and call-notes (whether to be found in spasmodic muscular contractions acting upon the trachea in moments of excitement or of effort, or to some necessity of emotional expression for purposes of social control [see Wallace Craig, 1908]) we can feel pretty sure that the song is the most advanced form of expression in the bird's vocal his-

tory. It is elaborated from pre-existing elements, and is in no wise conceivable as in itself an original form of utterance.

The above considerations cannot pass through the mind without bringing in their wake the question: Is there any useful purpose served in this fact of song elaboration? Does it get the bird anything it lacked before? Is an essentially songless bird a loser in the give and take of avian existence?

Witchell makes certain observations (p. 177) suggesting the possibility that in the strict social economy of bird life the elaborating tendency may be somewhat counteracted by some necessity of preserving the specific identity of both calls and songs for reasons of practical convenience. The calls certainly, and the songs almost as certainly, might lose their usefulness in a social sense if modified at the whims of individuals. But evidently individual modifications are not passed on and therefore do not become of racial importance. The slowness of organic evolution makes it plain that there must be deep-seated in birds, as in the rest of nature, an instinctive obedience to some principle of conservative action.

But just as plainly there is an instinctive recognition of the necessity of progress. That must explain why individuals get "freakish". But their freakishness avails the race nothing unless they get that way in groups, following a *racial* behavior pattern. It is a truism to say that life—including vocal bird life—implies within itself the need for growth, advancement. But even that does not satisfactorily explain why a bird improves its song: it merely says that he does because he does. Now, the following, I admit, is a theory. Given the primal necessity for song improvement, existing merely because the bird is *alive*, I believe that it carries with it and confers upon the bird, as a result of itself, some appreciation of itself. The bird, in other words, somewhat *appreciates* the work which it finds itself to have done in the line of song improvement. It is not unaware of its achievement, and is "interested" or "pleased" or even "elated". On what grounds? Because it feels the results to be useful or practical? I doubt it. Because it feels them to be pleasing—that's all. Insofar as vocal bird life is concerned, I cannot help believing that we are concerned with what Lloyd Morgan has called (p. 270) "the germs of aesthetics". In his lowly way—on his "perceptual" rather than "ideational" plane of mental development—why should not a bird, in his leisure moments and under the spell of the mating season, feel an impulse to outdo himself in song—an impulse heightened by his realization of results spontaneously achieved by mere virtue of living? I believe that herein lies the explanation of the evolution of bird song. The songster is an esthete. I shall say more of this beyond.

2. *The fact of elaboration through imitation.*—Upon analysis of the situation it becomes apparent that bird song can be elaborated in no other way than through imitation. The "mimetic origin of bird song" (see Rhoads, 1889) is not only the reasonable, but the inevitable origin—only we must here guard against understanding "origin" to be a synonym of "cause". Mimicry is certainly not the cause of song-development: it is the *method* employed—the only method, in the nature of things, available. Elaboration is imitation; though in many cases songs that we consider "original" may have been in reality copied from singers that have ceased to exist in the age and environment of the imitator (see Witchell, p. 227). It is, after all, quite natural that a species, working out its song through its individuals, should seize upon and utilize the notes of

other species. Where would the bird find material for its song if not through hearing it? New phrases in the human language are made up of old words, and the same thing holds in bird song. It would be impossible for a bird to "invent" or "originate" a song. But all of this is too obvious to require discussion. The elements of bird song must have pre-existed; they must have been first heard and then reproduced. In their ultimate analysis they must have been physical, derived from insensate sources and inanimate features of earth and the elements, or the involuntary and accidental movements of primitive voiceless things, animal or vegetable. But all of this is "another story" for which see Witchell (pp. 181-186). Coming back to what Witchell calls (p. 177) "that imitative tendency which is latent if not evident, in nearly every bird with any pretensions to a song"—let us ask again: What does song imitation (or elaboration) mean (if anything) in the social economy of bird life?

If the bird is in no wise responsible for anything that he does but is sustained in all acts by an ultimate cause, then it is perhaps vain to look for the meaning in his behavior. But if we conceive that the bird displays some consciousness of its own behavior, some intelligence of its own (even though it be a mere image of the greater intelligence, an effect worshipfully endeavoring to ape its cause) then we can at least observe the behavior of this "image" and come to some conclusion as to what *it* is trying to do and why. If we form some estimate of the bird's apparent intelligence, as we see it at work, we may gain a hint as to the true purpose that is being expressed or reflected therein.

To take an example of imitation in its most striking manifestation, let us turn for a few moments from the Brown Towhee to the Mockingbird. This bird, according to Lloyd Morgan (p. 193) represents a stage of "intelligent imitation, arising in close connection with interest in the doings of others . . .". The three stages (as illustrated by the human child) are, "First, the instinctive stage, where the sound which falls upon the ear is a stimulus to the motor-mechanism of sound production. Secondly, the intelligent stage of the profiting by chance experience. . . . If we assume that the resemblance of the sounds he utters to the sounds he hears is itself a source of pleasurable satisfaction (and this certainly seems to be the case), intelligence, without the aid of any higher faculty, will secure accommodation and render imitation more and more perfect. And this appears to be the stage reached by the mockingbird or parrot. But the child soon goes farther. He reflects upon the results he has reached . . .". Professor Morgan adds that "of intentional and reflective imitation there is at present no satisfactory evidence in any animal below man".

Let us examine a typical song of the Mockingbird (*Mimus polyglottos leucopaterus*), one recorded by me in the San Joaquin Valley, near Mendota, Fresno County, California, June 20, 1918. During a period of listening I recorded eleven "original" or un-imitated and nine imitated parts. The imitated parts, rendered in a manner that ranged from fair to perfect, were unmistakably referable to the following birds: Traill Flycatcher, English Sparrow, Western Belted Kingfisher, Ash-throated Flycatcher, Sparrow Hawk, California Cuckoo, California Shrike, Red-shafted Flicker, and Killdeer—all, by the way, birds present in the habitat of this individual Mocker. In addition to these notes the bird uttered several others which suggested the notes of other species without being quite enough like them to be fairly called imitations.

Whenever I hear a Mockingbird sing I cannot help wondering just where, if anywhere, the line can be drawn between the second and the third stage de-



scribed by Professor Morgan. In taking a "pleasurable satisfaction" in "the resemblance of the sounds he utters to the sounds he hears" is not something akin to reflection on the results necessary? Moreover, are the performances of the Mockingbird and the Parrot analogous? I do not believe they are. The mimicry of the Parrot is certainly associated with different instincts and emotional conditions than is that of the Mockingbird; for the Mockingbird—the *male* Mockingbird, let it be pointed out—is uttering his *song*, which, as is commonly agreed, is an emotional expression intimately connected with the sexual instinct, whereas, unless I am much mistaken, the "talking" of the Parrot rests on no such basis and bears no relation to sex feelings; but is more akin to mimicry as an instinct in itself such as we perceive in the actions and gestures of monkeys.

The Parrot undoubtedly does not rise above the second or "intelligent" stage, if indeed he attains it at all. He is *forced* to imitate, he is *taught* to imitate; he is removed from his natural environment, confined in a cage, and worked upon by designing minds that happen to know that his trachea is naturally suited to the production of human-like sounds. The Mockingbird on the other hand carries on his mimicry in the wild state. He needs no urging—sex is his urge—and, unless his behavior is very misleading, he not only takes a "pleasurable satisfaction" in the results of his vocal efforts, but he does so because he *dwells upon* those results with pardonable appreciation. After having, on so many occasions, noted the characteristic manner in which the Mockingbird "plays with" imitated sounds, rolling them about on his tongue one might say, as with the greatest gusto, trying them over and over, sometimes with little variations in inflection and intensity, seeming to be constantly experimenting with his material—I, for one, cannot avoid thinking that his mental state is characterized by a sort of reflectiveness.

I do not believe, however, that any practical considerations mark the bird's reflectiveness. I do not believe that the social economy of his life in any way determines or is determined by the results achieved. I believe that the bird's interest in his own mimicry is "artistic"—and the social economy can take care of itself as best it can. My reasons for holding the above beliefs are as follows.

The Mockingbird, as typically shown in the above described song, imitates a comparatively large number of birds, and he imitates them with sufficient skill to deceive them, provided they are susceptible to that sort of deception. Of the imitated birds concerned in our particular record, five are permanent residents and four are summer residents in the habitat of the imitator. In the summer they are all more or less prominent "citizens" of that part of the Lower Sonoran Zone where our Mocker is found. And our Mocker, without any too fine discrimination or apparent regard for the "feelings" of his neighbors, mimics them right and left, appropriating any and all sounds that are persistent enough to impress him at all. The affair is of social significance in that the whole community is involved. The Mockingbird drags all his most prominent neighbors into the performance and holds them up to mimicry. Are his neighbors aware of this fact? If so, does it make any difference to them, and how, if at all, do they re-act? And the mimic himself—what does he derive from the performance? Does he gain therefrom anything in a practical way for himself and for his species, especially for his mate? Or, on the contrary, does he cause himself and his kind only trouble and confusion?

So far as appearances go this incorrigible mimic is easily holding his own in "the struggle for existence." If his mimicry causes confusion among any of the species mimicked it apparently does not come back on him or his race. His mimicry, so far as I, myself, have ever observed, or read, or heard, does not cause confusion among his own kind. But I doubt if he *gains* anything beyond a certain "aesthetic pleasure"—an emotion doubtless shared with his mate, but not otherwise having any "social" significance.

It might be claimed, of course, that the Mockingbird "gets away with" his promiscuous mockery solely because of his pugnacious disposition and ability to take care of himself, whereas a less able bird, say a Goldfinch, might court death if it had the temerity to imitate a Sparrow Hawk or a Shrike. Personally, however, I cannot easily picture a Goldfinch\* (assuming it to be an imitative bird) meeting its death as the result of mocking a Shrike. The Shrike is not a gregarious bird, and the only call it might conceivably respond to (that is, fly towards) would be the sex-call of its kind. It would then respond in a wooing, not in a killing, mood.

Let me concede the possibility, however, that it might, on discovering its mistake, change its mood, and kill the Goldfinch. Such events would tend to eliminate from the racial song of the Goldfinch any and all notes copied from birds that prey on the Goldfinch, since, in each case, the individual doing the imitating would perish. But even though this may be the case with some birds, it does not seem to be with the Mockingbird, whom we may observe imitating "dangerous" birds with apparent impunity.

It seems to me utterly absurd that a Shrike should "imitate other birds for the purpose of attracting them within range of its attack"—a habit that Yarrell, as quoted by Witchell (pp. 173-174), attributes to the Great Grey Shrike. It very well may be that the Great Grey Shrike has imitative powers; and undoubtedly this bird is capable, in certain ways, of profiting by chance experience. But I cannot picture this as one of the ways: it is endowing the bird with too much intelligence.

I do not believe, then, that practical or economical considerations enter into the choice of sounds to be imitated by the Mockingbird or by any bird. The behavior of imitating birds does not indicate such to be the case.

There are two main factors, however, that I believe to be reasonably borne out by observable facts, influencing the choice of sounds to be imitated. In discussing these factors, let us return to the Brown Towhee as being a bird in the simpler and early stages of song evolution and as furnishing therefore a less complex "test case" for our purposes than the Mocker. To make our case definite let us keep in mind as our individual example the Brown Towhee of the Chalk Peak region of the Santa Lucias who imitated the Western House Wren. Let us make a note of the fact that he belongs to a non-migratory race. The association where I found him was arid Transition in the yellow pine belt. It is assumed that a bird is most influenced by the sounds of its environment during its own song period, that is, during the spring and summer months. With these ideas in mind, it can be demonstrated, I believe, that the number of bird-notes available for imitation in the habitat of our Brown Towhee is far more limited

\*Since there are no American birds besides the Mockingbird in the evolved stage of mimicry, I am forced to choose as my example a non-imitative bird. In contrast to the dearth of mimics in this country see Witchell's enumeration of imitative British birds (pp. 190-229).

than one would probably assume off-hand. The factors influencing his choice of notes are as follows:

(1) Persistency of the sounds in the imitator's environment. Such persistency determined by:

(a) Seasonal status of "subjects" of imitation. All transients and irregulars would be eliminated since their notes would not persist in the imitator's environment for a sufficient number of weeks nor would they persist during the imitator's impressionable period.

(b) Associational preferences of subjects. Those of extremely local or restricted range would be eliminated. This counts out the Bell Sparrow (which I found only on the sagey west slope of Chalk Peak); the Western Bluebird, the Pine Siskin and the Linnet (which showed a decided preference for the west slopes down toward the Redwoods); and the Violet-green Swallow and Martin (whose aerial habits kept them a good part of the time out of hearing of our imitator).

(c) Numerical distribution of subjects. Those of rare or occasional occurrence would be eliminated, namely, the Slender-billed Nuthatch, the Cabanis Woodpecker, the Nuttall Woodpecker, Western Kingbird, the California Thrasher, the Cassin Vireo, the Lawrence Goldfinch, the Black-throated Gray Warbler, the Western Gnatcatcher, the Point Pinos Junco, Mountain Quail, the Tawny Creeper, Mourning Dove, Audubon Warbler.

(d) Time of activity of the subjects during the twenty-four hours. Birds of nocturnal or crepuscular habits would be eliminated, namely, the Poor-will and any owls that might inhabit the region.

(e) General vocal strength of subjects. The following weak-voiced birds are eliminated: Creeper, Pygmy Nuthatch, Bush-tit, Bluebird, Siskin, Anna Hummingbird, Allen Hummingbird, Western Gnatcatcher.

(f) General vociferousness of subjects. The Buzzard is eliminated as being silent.

(g) Uniformity of utterance on the part of the subject. The Plain Titmouse is too versatile; does not stick long to any one note. The Thrasher, Black-headed Grosbeak and Purple Finch (whose persistent utterances are their songs) sing in a manner too long, "diffuse" and variable to allow any one sound to outstand.

(2) Physiological conditions connected with the peculiar nature of the syrinx and other vocal apparatus of the imitator. Obviously certain types of sound could not be managed by the comparatively unelastic and unpracticed syringeal membrane of the Brown Towhee. Thus at least two classes of sound would be physiologically unmanageable:

(a) Too voluminous sounds, such as those of the California Quail, Band-tailed Pigeon, and California and Crested Jays (heavy *chup-chup-chup* notes of each, and the common *zhrae* of the former).

(b) Too low sounds, such as those of the Mourning Dove and Band-tailed Pigeon.

Applying the above tests to all of the birds recorded by me during my stay in the Santa Lucia Mountains, I find that I have eliminated all but nine. These nine represent birds which have one or two utterances to be heard persistently all day long every day during the summer months. Following is a list of the birds and their notes:

California Woodpecker	"yarcob" and "cracker"
Red-shafted Flicker	"klee-yuh"
Ash-throated Flycatcher	"kippy" and "kip-preer"
Olive-sided Flycatcher	"peevue" and "puip-puip-puip"
Western Wood Pewee	"beeeezzzz"
Spurred Towhee	"thwaaaa" and song
Western Tanager	song
Western House Wren	song
Wren-tit	common "tattoo" call

These are thirteen sounds forcing themselves incessantly upon the Brown Towhee's attention. It is reasonable to assume, then, that they are the sounds most in line for imitation. The question is: *Why is the House Wren's song the sound chosen?*

"One of the most extraordinary facts of our life," declares William James (p. 217), "is that, although we are besieged at every moment by impressions from our whole sensory surface, we notice so very small a part of them. The sum total of our impressions never enters into our *experience*, consciously so called, which runs through the sum total like a tiny rill through a broad flowery mead. Yet the physical impressions which do not count are *there* as much as those that do, and affect our sense organs just as energetically. Why they fail to pierce the mind is a mystery . . .".

This was written concerning human experience, but I do not see why it is not just as applicable to bird experience. The factor of *attention* certainly enters into the situation. The Towhee "just naturally" attends to certain sounds and disregards others. As between a dozen sounds equally thrust upon his ears, he is for some reason *interested* in certain ones more than others, and therefore all the others are shut out of his conscious consideration.

To quote from Lloyd Morgan: "We often say . . . that *interest* guides behavior in this direction or in that. But such interest must not be regarded as an impelling force; it is an attribute of the conscious situation, more or less suffused with feeling-tone. It is not easy to define; but it seems to take on its distinctive character when representative elements contribute what Dr. Stout terms 'meaning' to the conscious situation".

When a Brown Towhee (acting for and in accordance with its race, due to the identity of germ-plasm in all members) selects the song of a House Wren rather than any one of the other eleven sounds equally forced upon its sense of hearing, the song of the House Wren must have some special *meaning* over and above the other sounds. Let me ask even again: Has this meaning anything to do with the social economy of Brown Towhee life? Is it a matter of life and death that certain types of sound shall be shut out of the conscious attention, and others heeded? And again let me reply that I do not believe any such thing. When it is becoming so questionable that even a human being is born with anything within him that causes him to act for the advantage of his own kind, why should we expect it in birds? Human beings show "interests" in things, but these interests are commonly in no way connected with race progress and are not even vital to the individual. I mean, it makes no killing difference if a wavering boy finally chooses radio operating instead of architecture. Nor does it make any more difference whether a Brown Towhee chooses to imitate a Wren song or a Flicker call. Insofar as a choice of musical sounds is concerned it does not seem reasonable that anything is at work except a sort of *taste*. Human beings like and pay attention to certain musical compositions above certain others. So does the Brown Towhee. In selecting the song of the House Wren he is guided, in my opinion, by a lowly sort of aesthetic feeling. Xenos Clark believes that birds have "an ear for music" and that in evolving their songs they follow a harmonic pathway, which, however, happens to be for them the pathway of least resistance. The primitive bird, he says (p. 212), "sang to please himself or his mate, and the most pleasing combination of notes was that most easily heard; the combination producing least friction and securing the

most economical action of the sound-receiving apparatus''. This places the matter on a purely mechanical and automatic basis, although the *results* are what we may call aesthetic. The results, I believe, are not unappreciated by the singer, and he re-acts with a more conscious exercise of "artistic taste". I believe, in short, that the actual *superior musical quality* of the House Wren's song, consciously appreciated by the Brown Towhee, is the final factor in the selection of *it* instead of the harsh "cracker" of the California Woodpecker, the yelping "klee-yuh" of the Flicker, and other more or less unmusical sounds in the list. But for further discussion of this theory I refer my reader to the final section of this paper. And now let me pass to the next division in order, namely:

3. *The fact of elaboration through adding the imitated syllables at the end.*—An analysis of the two Brown Towhee songs which are the subject of this paper reveals that they are the stereotyped song of the species *plus* some acquired syllables. The acquired syllables in each case occur *at the end* of the stereotyped song. Now, this manner of elaboration is, it seems to me, the easiest and most natural one—the one which a bird taking its first clumsy steps in the direction of song improvement would of necessity employ. Even human beings are inclined to have "single-track" minds that cannot easily accommodate two thought-trains abreast. They wish to do "one thing at a time"; otherwise they are apt to become flustered and end by doing neither of the two things intended. It seems perfectly natural that the Brown Towhee should sing the old familiar song *first*, and then give his undivided attention to innovating. Reverse this technique and we immediately picture the bird so flustered at his attempt to *plunge directly into a radically different type of utterance* that he would not be able immediately to pass on to the regular syllables. The accustomed song is the momentum, the encouragement, that carries him into the less familiar performance.

Witchell (p. 192) quotes Bechstein to the effect that the (European) Redstart "can improve its song . . . by adding to it parts of the songs of birds that are found near it". He vouches for the fact that Bechstein "accurately records that the Redstart *adds* the notes of other birds, for the imitations of this species are uttered at the end of the ordinary strain, to which they form a kind of *sotto voce* suffix".

The Redstart, then—even though mimicking a goodly number of other birds (Witchell, p. 218)—nevertheless *adds* the mimicked notes amateurishly (as I may call it) at the end, even as does the Brown Towhee. Both Redstart and Towhee, it would seem, are in the *practice stage* of mimicry, as opposed to the more advanced stage attained by the Mockingbird who interpolates imitated passages at will with all the assurance and independence of a human improviser. In England, it would seem, there are a number of such accomplished and evolved mimics, including the Thrush, the Robin, the Skylark, the Starling, the Sedge-Warbler, and the Nightingale (Witchell, pp. 194-219). In fact, one gathers the impression that mimicry is quite the thing in the best English song-bird circles!

4. *The fact of the comparative musical quality of the imitated syllables.*—The fact that the imitated portions in *both* of our two "off" Towhee songs, though borrowed from two different birds, nevertheless both contained a liquid *r*-sound and a vowel-sound of decidedly lower pitch than the piercing, high-frequency *i*-sound emanating from the traditional *tip!* of the species, suggests the idea that, other things being equal, the Brown Towhee is *interested in* sounds of a more fluent and of a softer nature than those used in his ordinary song.

Let us also here note, as of possible significance, the fact that the only *other* utterances possessed by the Brown Towhee besides his "bouncing" song are: (1) A succession of eight or nine rather distressed-sounding squeaking sounds, somewhat as one might squeak with one's lips, and (2) a faint high attenuation of what we may call the *family* "*tseep*" of the Fringillidae, some version of which is found in most of the sparrows. Neither of these two "other utterances" are in the least musical. Is it, then, endowing our bird with too much "aesthetic" sense to presume that through the ages he has been listening with something akin to admiration to sounds that were more musical than his own? Some people may object that sounds which are considered "more musical" by the cultivated human sense would not necessarily be so to the senses of lower animals. I do not agree with this objection. I believe in the *absolute superiority* of certain sounds over others. Sounds that we call musical are not so because we consider them such, but we, being the most cultivated hearers are the best judges of the *fact*. The same fact is in the course of evolution bound to be realized by other animals. In the Santa Lucia Brown Towhee's choice of what is *obviously the most musical sound of the thirteen sounds available for imitative use* I believe we see something not unrelated to *aesthetic taste*.

Let me state my concluding remarks in the form of three points, as follows.

- (1) The CAUSE of bird song evolution is the bird's *aliveness*.
- (2) The METHOD is of necessity *mimicry*, which in itself makes for song-elaboration.
- (3) The RESULT, therefore, is:
  - (a) an improved song;
  - (b) the bird's pleasurable awareness of this fact;
  - (c) the self-stimulation to still further improvement, resulting in a more conscious or deliberate employment of the mimicry METHOD through the exercise of MUSICAL TASTE.

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*Museum of Vertebrate Zoology, University of California, August 4, 1922.*

## NOTES ON THE YELLOW-BILLED LOON

By ALFRED M. BAILEY

THE following notes on the Yellow-billed Loon (*Gavia adamsi*) were made in southeastern Alaska while I was carrying on field work for the Biological Survey and are published with the permission of Dr. E. W. Nelson, Chief of that Bureau.

The migration of the Yellow-billed Loon has long been one of the problems of northern ornithological work and has been dealt with by numerous authors, Dixon (Auk, October, 1916) and Bent (Life Histories of North American Diving Birds, 1919) being the latest. The presence of this species in southeastern Alaska has been authenticated by the taking of a few specimens, but without positive notes for any extended period. Mr. George Willett has spent considerable time in the vicinity of Craig and Sitka since 1913, and has recorded the species but twice; one was seen in the winter of 1919, and an immature specimen was collected near Wrangell during the fall of 1920. Mr. Gray with 18 years active field work has never collected a specimen, although he has seen it a few times and has a specimen taken from a fish trap.

As I had rather exceptional opportunities for observing the water birds in southeastern Alaska during 1920, I was able to collect a series of nine of these rare loons and make many sight records ranging throughout the year except during the months of July and August. I first saw the yellow-bills at Oliver Inlet, on Admiralty Island, February 6. In my report for the trip I listed them as "two abnormally large loons" which were noted flying up the Inlet. I identified these as Yellow-bills, but as I had never encountered the species prior to this time, and do not believe in sight records for rare species when one is not actually acquainted with the bird, I allowed the record to rest for future verification. I next saw an immature in Rocky Pass, between Kuuiu and Kupreanoff islands, March 4; and again, the next day, while bucking a heavy wind in a blinding snow storm in the boat *Auklet* in Keku Straits, one came within a few feet of the bow of our boat. I again saw the species in the harbor at Wrangell on April 23, although I again failed to bring the bird to bag. It is to be emphasized that I identified these birds as Yellow-billed Loons at the time, but had no specimens to back the records.

Any one who has attempted to collect loons knows that the element of luck plays a far greater part than skill, and if he guesses wrongly as to the direction a loon takes when diving the first time, he might as well give up the bird. It was not until May 25 that I secured any specimens. I saw a fine adult bird off Marmon Island, the lower point of Douglas Island; and shortly after, in Gastineau Channel, I collected a big female in full plumage (length, 840 mm.; tarsus, 90; tail, 70; wing, 385). The ovaries of this specimen were undeveloped. Early the same morning, as we came down Stephens Passage, along Douglas Island, at least thirty loons were seen, but it was so foggy I could not identify them. Yellow-bills were next seen June 10 between Douglas and Admiralty islands, in Stephens Passage. There were three of them, two adults and an immature, of which I collected an adult and the immature. These birds appeared very conspicuous as they raised partly out of water, with wings outspread and strikingly colored beaks thrust skyward. Two other



large immatures were sighted a mile farther on, but I did not collect either. June 11 two immature loons were noted off Point Couverton, completing my records of the species for the spring months.

My first fall records were made in Seymour Canal, Admiralty Island. This broad inlet extends for more than fifty miles on the inside of Glass Peninsula, and is one of the favorite schooling grounds of herring. Consequently it is an especially favorable place for loons. During the heavy rains of September 30 and October 1, at least eight yellow-bills were noted, two adults the thirtieth, and six adult and immature birds the first. Again, on October 7, off Young's Bay in Stephens Passage, seven adult birds were seen in one flock. They were so gorged with fish they could not (or did not) rise from the water, but went pattering over the surface, as murrens sometimes do, until they were out of sight—all but one big male which I collected. This fellow was literally crammed with rock cod. (I have found that loons in flocks usually prefer to escape by flying, while single birds usually dive.) An immature was seen within a few miles; and on October 10 I took an adult off Point Couverton, while eleven others were positively identified the same day, between the Point and Glacier Bay, in Icy Straits, as well as two others within the confines of the Bay. Another immature was collected October 24 in Chatham Straits, and another noted; and an adult was taken at Killisnoo October 26, and another seen.

The yellow-bills, according to my experience during the year 1920, can not be considered as rare. They are extremely wary and give boats a wide berth, so one is apt to overlook them unless watching carefully. On October 10, while going up Icy Straits, the birds started for the shadows of the shore or the center of the channel to avoid us, when we were still five hundred yards away. With average light, it is almost impossible to identify yellow-bills, without the aid of binoculars, much more than gun-shot away; and for that reason I believe they have been overlooked by collectors. When a specimen is in the hand, the large size and colored bill seem so apparent that one could not fail to notice them; but in the water, especially in bad light, their size shrinks remarkably, and they do not look different from Common Loons. The last two specimens I collected, I was not positive of having yellow bills until I had the birds on the boat, in spite of the fact I had "worked" on the adult for an hour.

In flight, however, they can be told by their size. If the light is at one's back, these great, heavy-bodied birds stand out with startling clearness,—the long, arrow-like neck is thrust outward and the wings drive forward at tremendous speed. Outlined against the fleecy clouds, with snow-topped mountain ranges serrating the horizon, and ice-bergs of wonderful blueness in the channel ahead, these wanderers from the Arctic regions complete Nature's composition of an otherwise unfinished work of art.

*Colorado Museum of Natural History, Denver, Colorado, April 19, 1922.*

DISTRIBUTION OF *MOLOTHRUS ATER* IN CALIFORNIA  
WITH THE DESCRIPTION OF A NEW RACE

By DONALD R. DICKEY and A. J. VAN ROSSEM

DURING the late spring and summer of 1920, the writers took a series of cowbirds at Buena Vista Lake, Kern County, California. Pressure of other work prevented careful diagnosis at the time, and since birds of that region had previously been referred to *Molothrus ater obscurus*, that name was tentatively applied to these specimens. On further examination this series showed such a definite departure in characters from those exhibited by a large collection of *obscurus* from the Colorado Desert and adjacent regions, as to make a thorough analysis of the status of cowbirds in California seem advisable.

With this end in view, we have assembled or examined all of the material available in the Museum of Vertebrate Zoology and the Museum of History, Science and Art, together with many individual specimens gathered from private sources. Our thanks are due not only to those in charge of the ornithological collections of the institutions mentioned above, but also to the several private collectors who have so courteously placed their material at our disposal.

The resultant data has served to emphasize the fact that much remains to be done in the way of systematic collecting even in a State that has been as thoroughly canvassed as California. In the present instance there is adequate material from southern California, north to Mono Lake on the east, to Merced County in the San Joaquin Valley, and to Oxnard, Ventura County, on the Pacific Slope. North of these points we have been able to trace only a single specimen from the Modoc region, a stray migrant from the Farallon Islands, and two non-breeding birds from Santa Barbara County. Cowbirds are known to occur in fair numbers at various intermediate points, but specific records seem unexpectedly scarce and specimens lacking.

A general impression seems to have sprung up that cowbirds have only recently invaded California. It is unquestionably true that their numbers have increased greatly during the past few years, but in our belief this is due simply to natural increment rather than influx, and is adequately explained by the increasingly favorable conditions that have inevitably resulted from the present extensive development of dairying, truck-gardening, and irrigation projects in general. So far as we can determine there is no reason to suppose that Cowbirds, in small numbers, have not always been residents of the area. J. Grinnell<sup>(1)</sup> and Edward Wall<sup>(2)</sup> have already made some very pertinent remarks on this subject.

***Molothrus ater obscurus* (Gmelin)**

**Dwarf Cowbird**

Range in California: Southern California, from the Arizona line west to San Diego; north over the Colorado and Mojave deserts to Death Valley, the Panamint Mountains, and Independence, Inyo County; north through the San Diegan district to the vicinity of Ventura and, in winter at least, to Goleta, Santa Barbara County. Specimens examined (approximately 150) from the

<sup>(1)</sup> Univ. Calif. Publ. Zool., **5**, 1909, pp. 275-281.

<sup>(2)</sup> Condor, **21**, 1919, p. 209.

following localities: Imperial County: Calexico, Bard, Lano, Potholes, Pilot Knob; Riverside County: Mecca, Neighbors, Riverside; San Bernardino County: Lavic, Yermo, Victorville, Colton; Inyo County: Death Valley, Panamint Mountains, Independence, Shoshone; San Diego County: San Diego, National City, Borego Springs, Vallecito; Orange County: Anaheim Landing; Los Angeles County: Baker, Los Angeles, El Monte, Pasadena; Ventura County: Oxnard; Santa Barbara County: Goleta.

REMARKS: Broadly speaking, the life zone occupied by *obscurus* is Sonoran, with centers of abundance in the Lower Sonoran Zone along the Colorado River, at desert oases, such as Mecca, and in the irrigated sections of the Imperial Valley. The race is probably resident over its entire California range; certainly so in the southern part of the State. Specimens from the northern part of the San Diegan District are intermediate toward *californicus*.

### ***Molothrus ater artemisiae* Grinnell**

#### Nevada Cowbird

Range in California: In summer, the east-central section of the State, from Death Valley, the Panamint Mountains, and Independence, north to Mono Lake; also the northeastern section, in the Modoc region. In migration, and in winter, widely distributed over most of the State. Record stations outside the normal breeding range are: Los Coronados Islands (Lower California), September 5; Farallon Islands, June 2; Borego Springs, April 30; Neighbors, October 14; Yermo, June 7; and Mount Bullion, December 27. The record from the Sacramento Valley cited by Baird<sup>(1)</sup> may pertain to this form or to *californicus*. Of the 49 specimens examined, 26 are from the following California localities: Los Coronados Islands (Lower California); San Diego County: Borego Springs; Riverside County: Neighbors; San Bernardino County: Yermo; Inyo County: Furnace Creek Ranch, Death Valley, Panamint Mountains, Independence, Laws; Mono County: White Mountains, Mono Lake, Oasis; Modoc County: Alturas; Mariposa County: Mount Bullion.

REMARKS: As a breeding bird, the Nevada Cowbird is much more widely distributed zonally than either of the other forms occurring in California, since it ranges from Transition (Alturas), through Upper Sonoran (Mono Lake and Owens Valley), to extreme Lower Sonoran in Death Valley. Moreover, this race is distinctly migratory, whereas *obscurus* and *californicus* appear to be nearly or entirely resident. The sporadic occurrences during the summer at Yermo and on the Farallones can be most logically accounted for by considering these individuals as late or strayed migrants.

A certain amount of intergradation takes place between *artemisiae* and *obscurus* in Death Valley, the Panamint Mountains, and Owens Valley, particularly in the southern part. In addition, certain rather small examples of *artemisiae* from Mono Lake are undoubtedly accounted for by an infusion of *obscurus* blood. However, the blending of the two races is by no means the gradual one which is generally found in the intermediate area between two subspecies. This very imperfect fusion of the two forms probably indicates either a recent invasion of the range of one form by the other, or else a recent simultaneous occupation by both forms of an area formerly uninhabited by the spe-

<sup>(1)</sup> Reports of Explorations and Surveys from the Mississippi River to the Pacific Ocean, 1853-56, vol. 9, pt. 2, pp. 524-525.

cies. Breeding specimens typical of both *artemisiae* and *obscurus* are at hand from Death Valley, the Panamint Mountains, and Independence. To add to the complexity of the material from this region, several of the intergrades (possibly hybrids would be a better term) are practically indistinguishable from *californicus*, and were they taken in the San Joaquin Valley, would pass as examples of that form. In this regard the present case is clarified, however, by the exact analogy detected some years ago among the horned larks by Dr. H. C. Oberholser<sup>(1)</sup>. Briefly, the case may be summed up as follows: Where the two forms come together, a combination of their characters has resulted in a more or less typical reduplication, in certain individuals, of the characters of a third well-defined race occupying a distant and delimited area.

***Molothrus ater californicus*, subsp. nov.**

California Cowbird

DIAGNOSTIC CHARACTERS: FEMALES: Compared with *Molothrus ater obscurus*, size larger, tail proportionately shorter, and tarsi and feet much heavier; coloration darker, especially below (more slaty), and streaking sharper and more conspicuous. Compared with *Molothrus ater artemisiae*, size smaller; streaking of under parts narrower. MALES: The proportion of wing to tail is practically the same in the males of all three races, but the larger size, heavier tarsi and feet, together with the greater bill size of *californicus* will serve as distinguishing characters when compared with *obscurus*; the smaller size, particularly of these parts, will differentiate the race with equal facility from *artemisiae*.

TYPE: Female adult, H 707, collection of Donald R. Dickey; Buena Vista Lake, Kern County, California; May 20, 1920; collected by Donald R. Dickey and A. J. van Rossem; original number A. J. van R. 5366.

RANGE: In summer, the San Joaquin Valley of California, from the extreme southern end north at least to northern Merced County, and possibly north to include the Sacramento Valley; also east in favorable localities to the Sierra foothills, as at Weldon, Kern County, and Snelling, Merced County. Wandering west and south in the fall to Ventura County (Oxnard), and Santa Barbara County (Carpinteria), and in spring at least to Los Angeles County (El Monte). Specimens examined from the following localities: Kern County: Buena Vista Lake, Bakersfield, Weldon; Merced County: Snelling; Fresno County: Mendota; Santa Barbara County: Carpinteria; Ventura County: Oxnard; Los Angeles County: El Monte.

REMARKS: We have selected a female as the type because the differences between the several forms are (as is the case with certain races of *Agelaius*) more pronounced and uniform among individuals of this sex than among the males.

This form is apparently resident in the southern San Joaquin at all seasons of the year. In September, 1921, and in January, 1922, the junior writer found cowbirds almost, if not quite, as common in the vicinity of Buena Vista Lake as during the summer. No specimens were taken at these times, because for some reason the birds were extremely shy. A large series of fall, winter, and spring specimens taken outside the San Joaquin Valley fails to disclose any birds referable to this race, except those mentioned above. Intergradation with *obscurus* takes place in the northern part of the San Diegan District, for breeding birds

(1) Proc. U. S. Nat. Mus., 24, 1902, pp. 802-803.

from Los Angeles and Ventura counties are clearly intermediate in size and color. To the east, the Sierra Nevada Range forms an effective barrier to the interbreeding of *californicus* with either *artemisiae* or *obscurus*. Future collecting in the Sacramento Valley may disclose an intergradation with *artemisiae* in that region.

In working over the series of the present subspecies, it has particularly interested the authors to find this race apparently reaching its maximum development in wing length and in attenuation of bill on the South Fork of the Kern River. It is this same mountain valley which has produced *Agelaius phoeniceus aciculatus*, and it is of further interest to note that the distinctions which serve to separate *Agelaius p. neutralis*, of the San Diegan district, from *Agelaius p. aciculatus*, are paralleled in many respects by those which differentiate *Molothrus a. obscurus* from *Molothrus a. californicus*.

## MEASUREMENTS

*Molothrus ater californicus*

FEMALES (all from California):

Coll. No. <sup>1</sup>	Locality	Date	Wing	Tail	Tarsus	Culmen	Depth Bill at Base
H 707*	Buena Vista Lake	May 20, 1920	93.3	64.6	23.0	15.1	9.9
H 708	Buena Vista Lake	May 20, 1920	94.2	63.4	23.4	15.0	9.2
H 709	Buena Vista Lake	May 20, 1920	96.0	65.4	24.3	14.7	9.2
H 719	Buena Vista Lake	May 21, 1920	95.3	65.8	23.4	15.2	9.9
H 720	Buena Vista Lake	May 21, 1920	94.0	64.4	23.2	14.5	9.4
H 721	Buena Vista Lake	May 21, 1920	94.1	62.2	22.8	16.1	9.2
H 722	Buena Vista Lake	May 21, 1920	93.8	64.4	22.8	14.6	9.6
J 798	Buena Vista Lake	June 13, 1921	94.0	63.4	23.3	14.7	9.3
J 905	Buena Vista Lake	July 8, 1921	94.4	59.5	23.2	15.0	10.0
J 906	Buena Vista Lake	July 8, 1921	98.3	61.4	24.5	14.4	10.5
20101 <sup>2</sup>	Weldon	July 6, 1911	100.0	68.3	24.5	17.0	10.3
20102 <sup>2</sup>	Weldon	July 6, 1911	96.0	66.7	23.0	16.4	9.7
21547 <sup>2</sup>	Bakersfield	April 21, 1912	93.5	65.0	22.8	14.8	9.3
29186 <sup>2</sup>	Mendota	June 12, 1918	93.2	63.5	23.4	15.8	10.0
Minimum:			93.2	59.5	22.8	14.4	9.2
Maximum:			100.0	68.3	24.5	17.0	10.5
Average:			95.0	64.1	23.4	15.2	9.7

\*Type

<sup>1</sup>Collection of Donald R. Dickey, unless otherwise specified.<sup>2</sup>Univ. Calif. Mus. Vert. Zool.*Molothrus ater obscurus*

Eleven breeding females from Imperial Valley, and five from the San Diegan District.

	Wing	Tail	Tarsus	Culmen	Depth Bill at Base
Minimum:	90.0	61.0	21.2	13.7	8.5
Maximum:	97.5	68.3	24.0	14.8	9.8
Average:	92.8	64.6	22.5	14.2	9.3

*Molothrus ater artemisiae*

One breeding adult female from Humboldt County, Nevada, and six from Harney County, Oregon.

Minimum:	96.0	64.3	25.0	15.6	10.3
Maximum:	104.5	70.4	26.8	16.6	10.9
Average:	101.0	67.2	25.9	15.9	10.5

Average of eight breeding females from Death Valley, Mono Lake, and Independence, selected as showing that *artemisiae* in nearly typical form occurs at these southern points (intergrades with *obscurus* being excluded):

100.4	67.8	25.3	15.8	10.3
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*Molothrus ater californicus*

MALES (all from California):

Coll. No. <sup>1</sup>	Locality	Date	Wing	Tail	Tarsus	Culmen	Depth Bill at Base
H 702	Buena Vista Lake	May 20, 1920	107.8	75.2	25.5	17.6	10.4
H 703	Buena Vista Lake	May 20, 1920	108.5	75.4	25.4	17.4	10.0
H 704	Buena Vista Lake	May 20, 1920	103.0	72.4	24.0	18.1	10.0
H 705	Buena Vista Lake	May 20, 1920	105.1	73.0	25.0	17.0	10.5
H 706	Buena Vista Lake	May 20, 1920	105.4	73.8	24.6	17.5	10.1
H 710	Buena Vista Lake	May 21, 1920	100.0	73.0	25.0	17.8	10.6
H 711	Buena Vista Lake	May 21, 1920	103.5	71.2	25.3	17.4	10.8
H 712	Buena Vista Lake	May 21, 1920	100.5	68.5	23.8	17.1	9.4
H 718	Buena Vista Lake	May 21, 1920	102.0	70.0	25.5	18.0	10.4
H 728	Buena Vista Lake	May 23, 1920	105.0	72.4	24.0	17.7	10.0
H 825	Buena Vista Lake	June 2, 1920	102.2	68.7	26.2	17.1	10.1
H 826	Buena Vista Lake	June 3, 1920	106.2	73.1	25.7	17.6	10.4
J 816	Buena Vista Lake	June 19, 1921	102.4	72.3	25.4	16.6	10.1
19515 <sup>2</sup>	Bakersfield	May 10, 1911	100.0	69.4	24.4	17.3	11.0
19516 <sup>2</sup>	Bakersfield	May 10, 1911	106.4	78.1	25.4	17.6	10.7
20100 <sup>2</sup>	Weldon	July 6, 1911	103.0	71.4	25.0	18.2	11.0
25623 <sup>2</sup>	Snelling	May 29, 1915	100.0	69.0	24.3	15.7	10.0
29187 <sup>2</sup>	Mendota	June 15, 1918	102.5	72.0	25.3	16.5	10.5
Minimum:			100.0	68.5	23.8	15.7	9.4
Maximum:			108.5	78.1	26.2	18.2	11.0
Average:			103.5	72.2	25.0	17.3	10.3

<sup>1</sup>Collection of Donald R. Dickey, unless otherwise specified.<sup>2</sup>Univ. Calif. Mus. Vert. Zool.*Molothrus ater obscurus*

Twenty breeding males from Imperial Valley, and two from the San Diegan District.

	Wing	Tail	Tarsus	Culmen	Depth Bill at Base
Minimum:	97.5	66.3	21.0	15.6	9.3
Maximum:	106.5	77.0	25.0	17.0	10.9
Average:	102.1	71.0	23.7	16.5	10.9

*Molothrus ater artemisiae*

Ten breeding males from Humboldt County, Nevada.

Minimum:	111.3	73.6	26.0	17.0	10.6
Maximum:	118.4	82.4	29.0	19.5	11.6
Average:	114.3	77.6	28.0	18.0	11.2

Average of five males from Independence, selected as showing that *artemisiae* in nearly typical form occurs at these southern points (intergrades with *obscurus* being excluded):

110.3	75.4	27.3	18.4	10.8
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*Pasadena, California, September 22, 1922.*

## FROM FIELD AND STUDY

**The Capture of Water-fowl in Fish Nets.**—The recent note by Mr. Stanley G. Jewett<sup>1</sup> on the accidental capture of a White-winged Scoter (*Oidemia deglandi*) in a salmon net, is of particular interest in view of the fact that the Bureau of Biological Survey is giving attention to the use of nets to capture birds for banding purposes.<sup>2</sup>

As stated in the paper referred to in the accompanying foot-note, several forms of net traps have been successfully used, among them being the well-known "fyke" net. This contrivance is made by covering a series of four iron hoops, three to four feet in diameter, with cord webbing. When fully extended the hoops are about two feet apart, and the web cylinder thus produced is divided into two chambers by means of web funnels. The first of these has a large mouth while the second is much reduced. Short wings or guides of webbing are extended from the mouth of the trap and the whole affair is held in place in shallow water by long stakes forced into the mud.

In the marshes of the Illinois River these nets are used extensively for the capture of carp, buffalo, and other fishes, an energetic fisherman frequently running a line of forty to fifty "fykes". The nets are placed in areas where large numbers of ducks gather to feed, and it is common to find half a dozen mallards or pintails in a single net. During March, 1922, while engaged in banding work in this region, I made a practice of trying to beat the fisherman to the nets that were set in my neighborhood for the purpose of securing any ducks that might have been caught. Pintails were most frequently taken and it was noticeable that they were usually caught in flocks of four to six, indicating that they fed in small groups and were strongly inclined to "follow the leader".

In this connection, mention may also be made of a recent "return" from a Bufflehead duck that was banded by Mr. Verdi Burtch, at Branchport, New York, on April 6, 1922. Eleven days later (April 17) the bird was found entangled in a herring net in Georgian Bay, near Collingwood, Ontario.

The problem of evolving suitable methods for the capture of diving ducks for banding purposes will still require considerable experimentation, but present indications are that some form of a submerged net will prove most satisfactory. Such a device will, of course, require an arrangement that will bring captured birds safely to the surface after they have entered the chambers or pockets of the trap.—FREDERICK C. LINCOLN, U. S. Biological Survey, Washington, D. C., August 14, 1922.

**Northward Range of the Gray Vireo in California.**—While on a short collecting trip as guest of Mr. A. Brazier Howell, I spent the afternoon of July 25, 1922, on the west slope of Walker Pass, which is in northeastern Kern County, California, at the southern end of the main high Sierra Nevada. The feature of the occasion was my meeting with an adult pair of Gray Vireos (*Vireo vicinior*). The exact spot was on a steep, north-facing hillside within one-fourth mile south of "Jack's Station" (now merely a roadside camping place); altitude close to 4500 feet; life-zone Upper Sonoran, in a semi-arid phase of it. The birds were in sparse brush (*Garrya*, *Kunzia*, *Artemisia tridentata*, and *Cercocarpus betulaeifolius*); and a digger pine and a pinyon both grew within one hundred feet of where they were discovered.

I was first attracted by the broken, post-nuptially rendered song of the male—intermittent and sketchy, yet distinct enough from the songs of other vireos to be recognized at once. This male Gray Vireo was promptly shot. It proved to be in molt, with only two of the old tail-feathers remaining and with new feathers showing where old ones had fallen out, in the wings and in most of the body tracts. The weight of the bird was 12.5 grams. It is now catalogued as no. 43295 of the bird collection in the California Museum of Vertebrate Zoology.

A minute or two after shooting the singing bird, I caught sight of the other bird which I concluded was the female of the pair. The only note she gave was a low harsh *churr* or *shray*, given now and then as she hopped slowly through the twiggy. From the bushes she went into the pinyon tree before mentioned, and thence into the digger

<sup>1</sup>Condor, XXIV, May, 1922, p. 95.

<sup>2</sup>Auk, XXXIX, no. 3, July, 1922, pp. 322-334, pls. XI-XIV: "Trapping Ducks for Banding Purposes", by Frederick C. Lincoln.



pine, reaching the unusual height of some fifteen feet above the slope at the base of the tree. Her head was turned from side to side at frequent intervals, especially when she approached and eyed me curiously at a range of not more than twelve feet.

As for field characters, besides the general deliberateness of movement, the thick, dark-colored bill was well seen; the gray tone of color both above and below was noticeable; there was no crest, nor inclination to a crest. I was particularly struck by the relative great length of tail, for a vireo; also this member drooped, most of the time, below the axis-line of the body. It will be recalled that chaparral-dwellers in general, whatever their genetic affiliations, have relatively long tails—for example, Bell Sparrows, Bewick Wrens, Wren-tits, Gnatcatchers, Towhees, and Thrashers.

Some of the above observations will be found new or supplementary to those reported for the Gray Vireo from the San Jacinto region (Grinnell and Swarth, Univ. Calif. Publ. Zool., vol. 10, 1913, pp. 291-297).

This Walker Pass record is the northernmost in California so far known for the species. In fact, only one other occurrence has been reported from north of west-central Los Angeles County (whence reported by Loye Miller, Condor, xxiii, 1921, p. 194). This other northern record (Grinnell, Pac. Coast Avifauna no. 11, 1915, p. 144) is for a point at 2400 feet altitude near Bodfish, on the Kern River, in Kern County. An adult female (now no. 20679, Mus. Vert. Zool.) was collected there by Walter P. Taylor on June 16, 1911. It is in worn "breeding" plumage. Mr. Taylor's field-notes indicate that the bird was taken on a slope clothed in part with junipers and digger pines—evidently good Upper Sonoran. The date of capture would argue for its nesting in the immediate vicinity.

There are vast areas of the same sort of territory as has afforded the two Kern County records, around the southern Sierra Nevada. It all looks like perfectly proper country for Gray Vireos. I am tempted to believe that the species will be found widely, though not abundantly, represented there by someone seeking it in May or June, who is familiar with its song and habitat predilections.—J. GRINNELL, *Museum of Vertebrate Zoology, University of California, Berkeley, August 19, 1922.*

**Two Birds from the Bitterroot Valley, Montana.**—Ross Goose (*Chen rossi*). As most of the records of this goose in Montana are from points east of the divide, it seems worth while to record one that was taken at Corvallis, October 10, 1911. The specimen is a female, and is now in the Zoological Museum, University of Minnesota.

Rough-legged Hawk (*Archibuteo lagopus sancti-johannis*). Through an oversight I omitted this species from the list sent to Mr. Saunders several years ago. There is a specimen, a male bird, taken by the writer at Corvallis, January 10, 1910, in the Museum collection at the University of Minnesota. The species was a fairly common winter visitant in this vicinity.—BERNARD BAILEY, *Elk River, Minnesota, June 2, 1922.*

**Blackbirds Flocking.**—In the May, 1922, issue of THE CONDOR (p. 93) mention is made of the Yellow-headed Blackbird flocking with Brewer Blackbirds. It is not an unusual occurrence here to see a combined flock of Brewer and Red-winged Blackbirds, Cowbirds and one or two Yellow-heads all feeding together on the ground, generally about the early part of May. By that time the Cowbirds have arrived and the other several species have not yet scattered to their widely differing nesting grounds. On May 3, this year, I passed by one bull lying out in the pasture with an attendant group of three or four Cowbirds and one Yellow-headed Blackbird, though I cannot say I saw the latter perch on the bull's back like the Cowbirds.—L. B. POTTER, *Eastend, Saskatchewan, July 8, 1922.*

**Notes from Southwestern New Mexico.**—White-winged Scoter (*Oidemia deglandi*). An adult female was brought to me November 10, 1921. It had been taken from a flock of six, on a small irrigation pond on Duck Creek, thirty miles northwest of Silver City. None of our local shooters remember to have taken this species in this country.

Zone-tailed Hawk (*Buteo abbreviatus*). From Tyrone, Grant County, New Mexico, a fine adult female was brought to me on April 15, 1922. Another was seen on several occasions in the same locality. I have never before seen this species in ten years careful collecting in southwestern New Mexico.

Arizona Cardinal (*Cardinalis cardinalis superbus*). On May 8, 1922, at Red Rock, Grant County, New Mexico, these Cardinals were abundant, at least a dozen being seen, and a pair taken. The Gila River comes out of a tight "box" just northeast of Red Rock, and at that point their distribution up the river seems to end.

White-winged Dove (*Melopelia asiatica*). At Red Rock on the same date as above I took a male of this species. Ranchmen told me that these birds had appeared in this locality in the spring of the previous year (1921), but that they had never been noticed before that time.—R. T. KELLOGG, *Silver City, New Mexico, July 13, 1922.*

**Birds Eating Snails.**—In connection with the survey of infested areas and subsequent clean-up of the European snail, *Helix pisana*, at La Jolla, it is interesting to note that two birds have been observed by the writer as feeding on this mollusk.

The infested territory was burned over about three years ago and at that time enormous numbers of snails were killed, a very strong odor of burning flesh being apparent. Immediately thereafter flocks of sea gulls came in and feasted on the roasted snails; but, although outside of the burned area many live snails were in evidence on low bushes and shrubs, no gulls were observed to feed on them.

Another infestation of this snail at La Jolla has now occurred, and while making a survey of the district last week with Mr. A. J. Basinger of the Pest Control Division of the State Department of Agriculture, I noted a male English Sparrow busily engaged in feeding on young live snails clustered on a small dead Monterey cypress tree. At this stage the shells are, of course, soft and easily broken. The English Sparrow has long been regarded as an undesirable immigrant, but it would seem that it has scored a point in its own favor if it is to be regarded as an enemy of this destructive snail.—R. R. McLEAN, *County Horticultural Commissioner, San Diego, July 26, 1922.*

**The Snowy Egret in Los Angeles County, California.**—While studying shore-birds at Playa del Rey, September 25, 1922, Mesdames C. H. Hall, A. J. Mix, and F. T. Bicknell, members of the Los Angeles Audubon Society, were fortunate in having a close and unobstructed view of a Snowy Egret (*Egretta candidissima candidissima*). It was on a sand bar in the lagoon in company with a small flock of Western Gulls. Mrs. Hall was the first to sight the bird.

Standing in a semi-meditative attitude among the Gulls, not over two hundred feet from shore, the Egret offered a perfect opportunity for study. With field glasses as aids, though not a necessity, its pure white plumage, size, movements, graceful poses and other identification marks were carefully noted. We also observed the uplifting of one slender black leg, the opening and closing of the yellow toes, the stretching of the beautiful white wing, the opening of the long slender ebony bill with its yellow base, and the sleepy blinking of the eyes which enhanced the yellow of the iris. An occasional light puff of the sea-breeze raised and ruffled the snowy feathers on the bird's head and back, giving a momentary semi-nuptial plumage effect.

The encroaching waters of the incoming tide moistened the sand under the Egret's feet, which it resented by moving a few paces nearer the indifferent Gulls. For fully twenty minutes we studied this beautiful and rare bird, when suddenly, alone and without warning, it took flight above the lagoon and disappeared among the sloughs of the adjoining marsh lands.

The larger, American Egret (*Herodias egretta*) is a regular winter visitant on the San Pedro tide lands and Seal Beach salt marshes and is often studied by the Audubon members. Reporting the event to Mr. L. E. Wyman, Ornithologist at the Los Angeles Museum, he suggested, since the Snowy Egret has so few records in this vicinity, that it was well worth mentioning.—MRS. F. T. BICKNELL, *Los Angeles, California, October 2, 1922.*

**Perching Pelicans.**—Three times in the past three years I have seen individuals of the California Brown Pelican (*Pelecanus californicus*) perch on the wire stretched just above the top of the rail of our pier. This wire is about  $\frac{1}{8}$  inch in diameter and it is stretched fairly taut, being supported at intervals of about ten feet by upright spikes so that its height above the pier rail is about four inches.

At 7:52 A. M. on September 19, 1922, while working at the end of the pier I noticed a Brown Pelican alight on the rail about one hundred feet away. I quickly took

a fairly comfortable position with the intention of observing the bird's actions as carefully as possible. I could see his feet distinctly and his toes seemed to curl around and grasp the wire in the same way as those of a perching bird. He was standing almost erect and teetering a good deal in an effort to find his balance. Several times the pelican tried to stoop to a sitting posture but with very unsettling results. Once while trying to preen his breast feathers he almost fell over backward and had to flap his wings vigorously to get balanced again. Finally he became satisfied with the erect posture and remained in it for probably ten minutes. In the erect posture for a time his balancing movements were so nearly imperceptible at one hundred feet distance that I would not have been able to detect them if I had not had the advantage of a series of cross wires on a gate within about thirty feet of the bird. By use of these wires I was able to estimate that at best there was rhythmic movement of the head up and down through a distance of at least a half inch, varied every few seconds by a longer swing of two to three inches.

Just before this relatively stable period he had lifted first one foot and then the other several times as though the wire hurt his feet. Indeed, this performance reminded me very much of a barefoot boy trying to stand on a hot pavement. At the end of the quiet period the pelican began side-stepping and walked on the wire a distance of about four feet at the end of which he turned around facing in the opposite direction. In making the turn he got a good deal unbalanced and saved himself from falling by stepping onto the wooden rail with one foot. He again assumed the erect position and remained thus for some little time until excited by the screeching of a flock of gulls which flew near him. At 8:15 he flew away after having perched on the small wire for twenty-three minutes.

When first alighting he had been facing the pier and away from the water. The half turn made after the side-stepping performance brought him into a position facing the water. Before beginning the side-stepping he had made several efforts to stoop, with very strong appearance of getting ready to fly. Every effort to stoop destroyed his balance and he could not get a good jump into the air for starting flight. I do not think it possible that he could have gotten enough jump to enable him to clear the opposite rail. Whatever the actual reason for the half turn it certainly put him into position (facing the water) to launch easily into flight.

I have mentioned a failure to keep balance while attempting to preen. There were two or three fairly successful attempts but they were confined to very small adjustments of breast feathers with very brief action. At various times in the perching period the head was rotated from side to side but this did not involve much shifting in weight and was not very disturbing to balance.

The three cases which I have seen indicate that pelicans do have perching ambitions and that they can make a very creditable showing in a difficult situation. Do such performances indicate vestigial or initiatory tendencies in behavior?—W. E. ALLEN, *Scripps Institution for Biological Research of the University of California, La Jolla, September 20, 1922.*

## EDITORIAL NOTES AND NEWS

The editors of THE CONDOR are once more indebted to Mr. J. R. Pemberton for assistance. The annual index concluding our present volume was in large measure prepared by him.

Volume II, numbers 3-4 (in one), of Dawson's "Journal of the Museum of Comparative Oology" (Santa Barbara) reached our desk on October 31. A very important new nesting record for California is that, by Mr. W. L. Dawson, of the Yellow Rail in

Mono County. Mr. A. B. Howell contributes an article on "The Ethics of Collecting" which is fraught with sound sense; the principles set forth ought to be followed conscientiously by all collectors, and then there would be far less of criticism levied at the fraternity than is, unfortunately, now the case. The greater part of this issue of the "Journal" is occupied by accounts of nest-hunting, chiefly with the Sierra Nevada Rosy Finch as the objective, and with the human-interest element emphasized rather than the ornithological.

Volume III, number 3, of "The Murrelet", mimeographed "Official Bulletin of the Pacific Northwest Bird and Mammal Club", reached us November 10. The editor, Mr. F. S. Hall of the Washington State Museum, Seattle, is to be congratulated upon the success of his efforts to produce a creditable journal with small resources. This issue contains several articles and notes on birds, valuable at least from a local standpoint, under the authorship of J. Hooper Bowles, S. F. Rathbun, Kenneth Racey, Walter F. Burton, C. de B. Green, E. A. Kitchin, and others.

The Chicago meeting of the American Ornithologists' Union, held October 23 to 26, was well attended. More than forty papers were read. Elections included Dr. Arthur A. Allen to the class of Fellows, and D. R. Dickey, A. O. Gross, W. Huber, T. I. Storer and J. T. Zimmer to the class of Members.

Mr. M. P. Skinner, Yellowstone Park, Wyoming, is contemplating early publication of his book on the "Birds of the Yellowstone". Readers of *THE CONDOR* are already familiar with the type of literature produced by Mr. Skinner. He is an accurate observer and good writer, and his book, we predict, will constitute a worthy contribution to western ornithology.

Mr. Howard H. Cleaves, formerly with the San Diego Natural History Museum, is now located at Clarksburg, West Virginia, where he is serving as state secretary for the Wild Life League of West Virginia. The object of this society is to spread the conservation-of-game idea in a state where conservation is badly needed.

It is our conviction that the best piece of conservation legislation proposed for a long time is just now pending before Congress. This is Senate bill 1452 (H. R. 5823), which bill provides for the establishment of game refuges and properly regulated public shooting grounds. Its provisions would be carried out under the auspices of the United States Bureau of Biological Survey, and this would mean its administration upon a logical, scientific basis. We recommend that Cooper Club members support this bill by expressing their approval of it to their legislative representatives in Washington. The bill is likely to be brought up for final action early in the new session of Congress.

Mr. Edgar Chance, a British ornithologist, is the author of a late book entitled "The Cuckoo's Secret" (London, Sedgwick and Jackson), in which the egg-laying habits of the European Cuckoo are described and illustrated from photographs in great detail. A moot point has long been as to whether the bird lays its egg directly into the nest of the victim, or deposits its egg elsewhere and places said egg by the way of its beak into the foster nest. Mr. Chance is so sure of the correctness of his own conclusions, which are of the former import, that he has issued a "challenge" involving a wager of 500 pounds with anyone who wishes to set out to prove the contrary. Thus he hopes to stimulate further careful and scientific enquiry into "the cuckoo's secret". And at the same time the Englishman's love of sport will come into play!

Professor Lynds Jones, head of the Ecology department at Oberlin College, conducted a party of eleven students, via "Fords", from Ohio to California the past summer. The enterprising members of the party thus had the advantage of an ideally practical course in geographical distribution.

## COMMUNICATIONS

### THE PRESENT STATUS OF THE SUBSPECIES

To the Editor of *The Condor*:

In these days when ornithological nomenclature and taxonomy seem to have become of more importance than the birds themselves, the primary or, indeed, the sole object of our system is not to be lost sight of. A scientific name, once it is bestowed, is after all only an assembly of two or three words so grouped as to convey an idea of the approximate perch height of the lucky or unlucky recipient in the genealogical tree; or, to put it differently, a statement of the evolutionary progress made by the particular group or individual in question, down to the year A. D. 1922, or whenever the baptism took place. Now, it seems to me that the fact that a certain horned lark's back, or a certain fox sparrow's bill is different from the backs or the bills of horned larks or fox sparrows occupying other areas is distinctly secondary to the fact that separate geographic situations have caused certain changes to take place. Unfortunately, our only way of expressing what has happened is in terms of millimeters or of color, or by some other equally unsatisfactory designation. These means of describing what changes have occurred

are undoubtedly what have given most people a wrong conception of systematic work in general, and of the so-called "subspecific" races in particular. If the rank and file of bird students would put aside the idea that "microscopic" subdivisions of plastic species are made only for the purpose of bestowing new names, and think of the determined "subspecies" as admittedly short, but still definite steps along the evolutionary highway, not only would the whole science of ornithology be benefited by a new interest, but we would be spared much of the ranting about "hair splitting", in which well-meaning but misguided souls indulge from time to time. What constitutes a subspecies is just now a difficult question to answer. A composite opinion gained by personal conversation, and by perusal of current literature can be best expressed by, "Why is a hen?" Some would use only a binomial for every recognizable form, others want to reduce to subspecific status all species bearing close resemblances to one another, and still others champion two kinds of subspecies! Obviously, the adoption of any of these extremes would work much harm, if for no other reason than that the true genetic relationships between most forms would not properly be expressed by the terms employed.

Most conservative ornithologists advocate a middle course and believe that intergradation should be actually proven before reducing any form to subspecific status. But, what sort of intergradation? If we take into consideration all angles of the problem, what can we possibly accept save that of geographic continuity,—an actual *blood* relationship? To designate as varieties geographically isolated forms which have been completely segregated for thousands, perhaps tens of thousands of years from similar organisms found in another area (or even on another continent!) simply because overlapping characters are shown by a few individuals is *not* telling the true story of conditions which now exist. True, there was undoubtedly one common ancestor; but so, for example, was there for all the grebes, or for all the gulls. If intergradation of all present-day species of grebes, or between any two of them were to be established through fossil remains—and this is not an impossible hypothesis—then, to be consistent, we should have now to regard them as subspecies! Intergradation through individual variation is inviting too many chances for error. As Grinnell (*Auk*, vol. 37, 1921, p. 469) has pointed out, what as-

surance is there that young or subadults or even "sports" may not be used in attempting to prove the point?

The criteria of isolation for the use of the binomial and of actual blood fusion for use of the trinomial will, I believe, prove the ultimate ones to be adopted not only because they permit of more accuracy in allocation, but also because of the uniformity possible under their use.

Yours very truly,

A. J. VAN ROSSEM,

*Pasadena, California, July 14, 1922.*

#### LIFE HISTORIES OF NORTH AMERICAN BIRDS

The Editor of The Condor:

Realizing that no one man can know all there is to know about all the birds and that the completeness of the Life Histories of North American Birds depends on the coöperation which the author receives from others, I wish to make this report of progress and appeal to your readers for contributions, trusting that you will find the space to publish it at an early date.

Two volumes have been published and the third, containing the Petrels and Pelicans and their allies, is printed and should soon be out. The manuscript for the fourth volume, containing the Ducks, up to and including the Ring-necked Duck, is now in Washington in finished form and ready for publication. It is not too late to add to this, when I correct the galley proof, any notes of importance on habits or distribution, and not too late to substitute any particularly fine photographs for those that I have already selected.

I am now at work on the fifth volume, which will contain the remainder of the Ducks and the Geese and Swans. I expect to finish this during the winter and send it to the publishers in the spring. The life histories are practically all written, subject to revision, but the photographs have not been selected.

I have no notes on the courtship of the American and White-winged Scoters or of any of the Geese, except the Canada, or on any of the Swans or Tree Ducks. I have no nesting photographs of Harlequin Duck, Barrow Golden-eye, any Geese except White-fronted and Canada, any Swans, or any Tree Ducks. I should be glad to receive contributions of notes or photographs to fill in any of these gaps. Or I should be glad to correspond with anyone who has anything else to offer. I am, of course,

well supplied with photographs illustrating nests, eggs and young of all the common species, but there are many gaps still to be filled. I am trying to read everything that is published on American birds, but I have no access to private notes, that have not been published, unless they are sent in as contributions. I shall soon begin work on the sixth volume, which will contain the Herons and Rails and their allies. Contributions for this would be welcome at any time. Contributors will receive full credit for whatever material they send in and, if it is material that I can use, their names will be placed on the mailing list to receive the volumes when published.

Those who have seen the earlier volumes can understand what is wanted. Hoping for some generous coöperation I am,

Very truly yours,

A. C. BENT,

*Taunton, Massachusetts, September 13, 1922.*

#### MINUTES OF COOPER CLUB MEETINGS

##### NORTHERN DIVISION

**JULY.**—The Northern Division of the Cooper Ornithological Club met at the usual place and hour on July 27. Pres. Swarth presided and the following members were present: Mesdames Allen, Ferguson, Grinnell, Kelly, Steilberg; Miss Pringle and Miss Flinn; Messrs. Bunker, Cooper, Dixon, Evermann, Hunt, Willard Grinnell, L. H. Miller, Storer, Swarth, and Wright. Among the visitors were Mrs. Bunker, Mrs. Cooper, Mrs. Hunt, Mrs. Slack, and Mr. Jaeger.

June minutes from the Northern and Southern divisions were read and the former approved. Mr. Edmund Carroll Jaeger, 146 W. 6th St., Riverside, was proposed for membership by H. S. Swarth, and Mr. Clark Blickensderfer, 850 Grant St., Denver, Colorado, by Tracy I. Storer.

Dr. Evermann reported the departure of scientists who have undertaken an expedition to the islands off the coast of Mexico and southern California under the joint auspices of the Mexican Government, the California Academy of Sciences, and the U. S. Bureau of Research to investigate as to the presence of fur seals.

Prof. Loye Holmes Miller then gave an outline of the materials so far available to students of fossil birds in California. Adjourned.—AMELIA S. ALLEN, *Secretary Northern Division.*

**AUGUST.**—The regular meeting of the

Northern Division of the Cooper Ornithological Club was held at the usual place and hour on August 24, 1922. Mr. Swarth was in the chair and the following members and friends were present: Messrs. Bell, Bunker, Chas. Bryant, Cooper, Dice, Grinnell, Hunt, Mailliard, Storer, and Stow; Misses Atsatt, Burk, Flinn; Mesdames Allen, Bogle, Davenport, Grinnell, Kelly, Mead, Roe, and Schlesinger. Visitors were: Mrs. Bunker, Mrs. Nimmo, and Mr. Hatt.

Minutes of the July meeting were read and approved, and the following names were presented: Miss Ethel M. Archer, R. D. 4, Anaheim, Miss Althea McIntyre and Miss Marietta Martin, 1345 P St., Fresno, by Miss S. R. Atsatt, and Mr. George W. Moore, 318 E. 9th St., Tulsa, Oklahoma, by W. A. Strong.

Business completed, the members present contributed observations from different localities visited during the summer. Adjourned.—AMELIA S. ALLEN, *Secretary.*

**SEPTEMBER.**—The regular meeting of the Cooper Ornithological Club, Northern Division, was held at the usual time and place on September 27. Vice-President Cooper was in the chair and the following members were present: Mesdames Allen, Bogle, Davenport, Reygadas, and Schlesinger; Misses Atsatt, Ayer, Burk, Flinn, Gunn, Woodruff, and Wythe; Messrs. Bassett, Bryant, Cooper, Evermann, Gignoux, Storer, and Wright. Visitors were: Mrs. Bassett, Miss Bassett, and Miss Cooper.

Minutes of the August meeting were read and approved and the July minutes of the Southern Division were read. Applications for membership were received from Mrs. Nina M. Slack, 304 E. 16th St., Oakland, sponsored by Amelia S. Allen; Mr. Kenneth McLeod, Jr., 2324 Vine St., Berkeley, sponsored by J. Grinnell; Miss Edna M. Fisher, 2410 Fulton St., Berkeley, sponsored by Tracy I. Storer, and Mr. and Mrs. C. R. Thomas, 2022 Francisco St., Berkeley, sponsored by Amelia S. Allen. The Southern Division submitted the name of Mr. George Frean Morcom for honorary membership in the Club, final action to be taken at the October meeting.

Business completed, the club listened to an account of a motor trip through the North-west by Mr. F. N. Bassett. Adjourned.—AMELIA S. ALLEN, *Secretary.*

##### SOUTHERN DIVISION

**JULY.**—Regular monthly meeting of Cooper Ornithological Club, Southern Division, was held July 27, 1922, at the usual hour

and place. Dr. Rich presided, with the following members present: Mesdames Brown, Law, Schneider, and Warmer; Misses Ellis, Potter, Delphia Miller, and Mary Mann Miller; Messrs. Allen, Chambers, Colburn, Girvin, Grinnell, Hanaford, Hart, Howard, Howell, Law, Little, Millard, Robertson, Trehwella, Warmer, and Wyman. Visitors were: Mesdames Anthony, Trehwella, Vaughn and Wyman, and Mr. Hill.

Minutes of the June meeting were read and approved, while reading of Northern Division minutes for May and June, on proper motion, was omitted. Applications for membership were: Clifford M. Drury, 2407 Dana St., Berkeley, by Dr. Warmer; Raymond A. Campbell, Huntington Beach, and H. R. Hill, 815 W. 37th St., Los Angeles, by L. E. Wyman. The Northern Division sent the names of Frank O. Adams and Frank Bacon.

The following proposition was read by the Secretary: "We, the undersigned active members of the Cooper Ornithological Club hereby propose for Honorary Membership in the Club, George Frean Morcom. We believe this to be an appropriate way of recognizing Mr. Morcom's long and loyal support of the Club and of its ideals." Signed: W. Lee Chambers, Guy C. Rich, O. W. Howard, J. Eugene Law, Howard Robertson.

Mr. J. Grinnell then read a paper entitled "An Inquiry into the Supposed Decrease of Bird Life in California." He placed the subject in a new and interesting light, and the general and lengthy discussion that followed closed the session. Adjourned.—L. E. WYMAN, *Secretary Southern Division*.

AUGUST.—Regular meeting of Cooper Ornithological Club, Southern Division, was held at Los Angeles Museum at 8 P. M., August 31, Dr. Rich presiding. Other members present were: Mrs. Brown; Messrs. Appleton, Bramkamp, Campbell, Chambers, de Laubenfels, Hill, Howell, Lamb, Law, Miller, L. Peyton and Wyman. Visitors were: Miss Vaughn, Mrs. Hill, Mrs. Wyman, and Alden Miller.

Minutes of July meeting were read and approved. New presentations were: Mrs. Joseph Anthony, 629 No. Belmont Ave., Los Angeles, by Mrs. Schneider; Frederick C. Lincoln, Biological Survey, Washington, D. C., Margaret W. Boardman, 1239 W. 11th St., Los Angeles, Helena Krause, 820 26th St., San Diego, and Grace A. Hill, 2143 Cedar St., Berkeley, all by Mr. Chambers; Mabel Adelaide Myers, 617 W. Center St., Anaheim, by Mr. Pierce; Edmund C. Jaeger, 1462 W. 6th St., Riverside, by Mr. Swarth.

The Northern Division sent the names of Dr. C. H. Wood and Clark Blickensderfer.

A circular from Dr. E. W. Nelson, Chief of the Biological Survey, explanatory of the proposed "Public Shooting Ground Game Refuge Bill", was read by the Secretary. Mr. Law moved that the Southern Division of the Club go on record as favoring this bill, and that the California Fish and Game Commission be advised of this action. Seconded by Mr. Chambers, and carried.

Inspection of a miscellaneous lot of Alaskan birds, and the attendant general discussion, ended the session. Adjourned.—L. E. WYMAN, *Secretary*.

SEPTEMBER.—Regular meeting of Cooper Ornithological Club, Southern Division, was held at 3 P. M., September 24, at the home of Dr. L. H. Miller, Los Angeles. President Rich held the chair. Twenty-three members and eight visitors were present.

Minutes of the August meeting were read and approved, while those of the Northern Division for July and August were read by title only. Mr. Chambers presented the names of Perley Arthur Smoll, 822 E. Monument St., Colorado Springs, Colo.; Harvey T. Kimball, Magma Copper Co., Superior, Ariz.; Archibald Douglas Henderson, Belvedere, Alberta, Canada; and Karl A. Pember, Woodstock, Vt. Charles L. Whittle presented the name of Charles Benton Floyd, 454 Wolcott St., Auburndale, Mass.; Mrs. Marion Ware Low, 27 La Brea St., Hollywood; and Laurence Brown Fletcher, 57 Catswold Road, Brookline, Mass. Karl R. Coolidge, Box 12, Hollywood, was sponsored by Mr. van Rossem. The name of George W. Morse came from the Northern Division.

A letter from the California Fish and Game Commission, defining their attitude toward the Public Shooting Ground Game Refuge bill, was read by the Secretary. This shed new light on the subject, and on motion of Mr. Law, seconded by Dr. Miller, the members voted to hold in abeyance further action relative to the proposed bill.

A complimentary membership card in the Los Angeles Audubon Society, made out to the Club, was presented by the Secretary. Dr. Miller moved that the Secretary be instructed to write to the Audubon Society a letter of appreciation of the honor conferred. Seconded by Miss Miller; carried.

The meeting then adjourned to the informality of the customary watermelon feast and general sociability. Adjourned.—L. E. WYMAN, *Secretary*.



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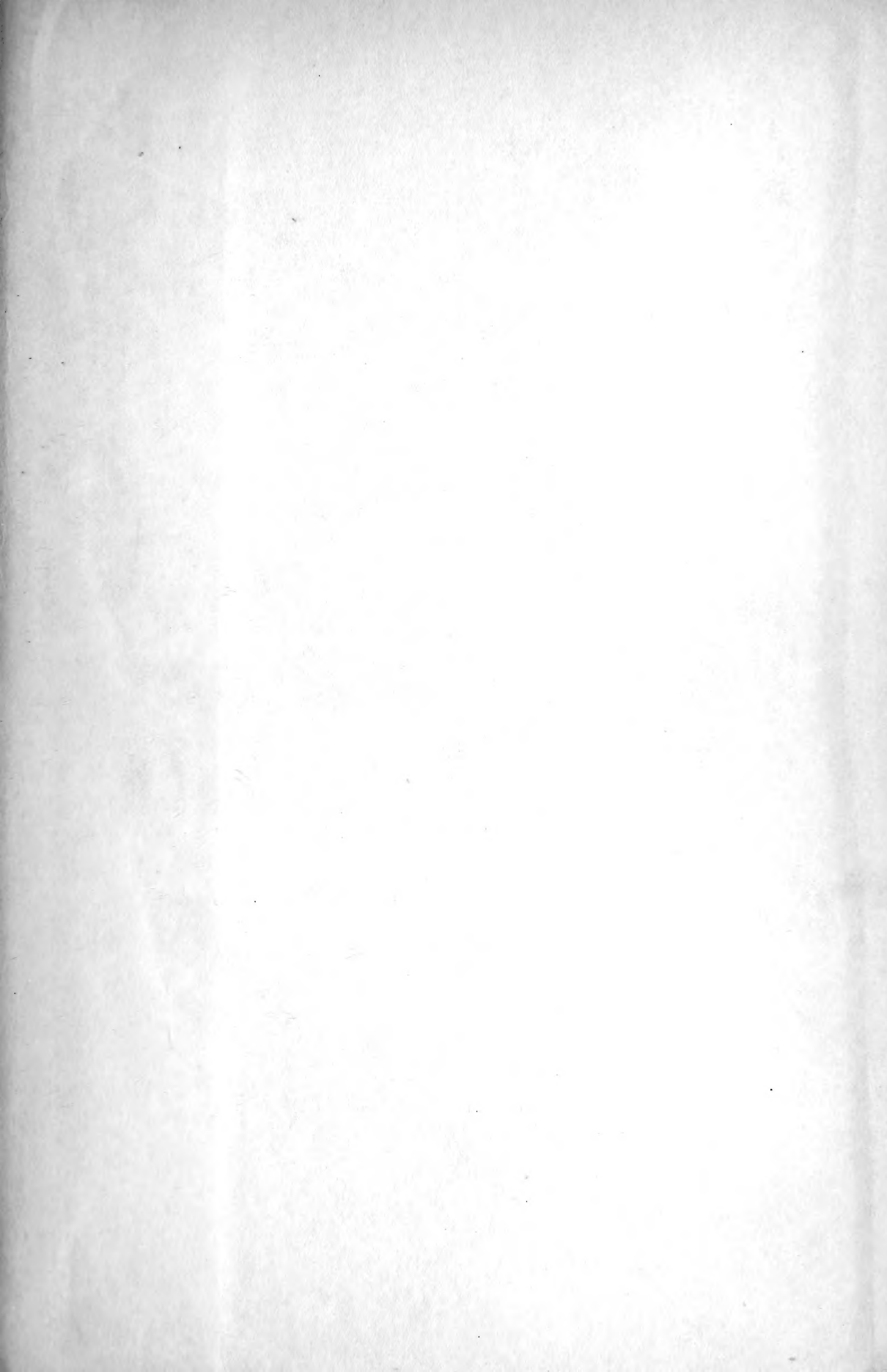












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